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MATERIAL AND MEANING: A CONTEXTUAL EXAMINATION OF SELECT PORTABLE MATERIAL CULTURE FROM COLHA, BELIZE

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by

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MATERIAL AND MEANING: A CONTEXTUAL EXAMINATION OF SELECT PORTABLE MATERIAL CULTURE FROM COLHA, BELIZE

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This dissertation presents the results of a contextual analysis of select portable material culture from the Maya archaeological site of Colha. The assemblage is comprised of 2,264 artifacts of varying material and form that are commonly referred to as miscellaneous artifacts or small finds. In the Colha collection a variety of raw materials are represented including antler, bone, clay, coral, metal, shell, specular hematite, speleothem, and stone. Several technological systems of production are found and reported   Contexts represented in the assemblage include middens, construction fill, burials, and cache offerings. The majority of the assemblage was derived from the depositional behaviors of burial, caching, and discard.

While a traditional metric and attribute analysis is incorporated, a primary goal of this study is placing and analyzing each artifact in its archaeological context. The contextual component allows for the revelation of inherent contextual patterning. The resulting patterns enable suppositions regarding the behaviors responsible for the deposition of the select portable material culture of Colha. Inter-site comparisons are used to establish regional depositional patterns or trends. The research presented in this dissertation has illustrated that the cultural and social significance of the select portable material of Colha may be best described through contextual analysis and patterning.

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CHAPTER 1

INTRODUCTION

This dissertation presents the results of an analysis of a particular group of portable material culture from the prehistoric Maya site of Colha, located in northern Belize, Central America (Figure 1.1). The assemblage is comprised of 2,264 artifacts of varying material and form, which are commonly referred to as miscellaneous artifacts or "small finds" (see Buttles 1992a; Garber 1981, 1989; Lee 1969; Sheets 1978; Sidyrs 1983; Willey 1972, 1978, Willey et al. 1994). Their grouping into a single analytical unit is purely arbitrary and has no cultural significance. Typically, these artifacts cross into, but do not "fit" traditional fields of analysis such as ceramic, lithic, and faunal. An example is seen in the reuse of ceramic sherds to serve a new purpose such as that of net weights.

Artifact "types" frequently included in this all-encompassing category are adornments, figurines, whistles, stamps, tools, and small items of unknown function often deemed "specials". In the Colha collection a variety of raw materials are represented including antler, bone, clay, coral, metal, shell, specular hematite, speleothem, and stone. Several technological systems of production are found. The majority of artifacts were recovered from middens, construction fill, burials, and cache offerings. Many functioned as personal ornamentation in life and in death.

Figure 1.1. Map of the Maya area with major archaeological sites indicated, (after Houk 1996:3)

Represented within “small finds” are artifacts that were used to perform a variety of tasks and activities that encompass both practical and prestige technologies as defined by Hayden (1988). An example of these tasks and activities include spinning thread, weaving, and fishing. Defining the artifacts that aided in these activities and tasks allows a glimpse into a part of the Maya world not often addressed in site reports and articles.

What is not represented in this assemblage are the countless number of artifacts that were made of perishable materials including plants, animal parts, wood, and cloth. It has been suggested that 90-95% of prehistoric material culture was made of perishable materials (Drooker 2001:4). For the Maya area, evidence of perishable materials is preserved on painted murals, ceramic vessels, and carved stone. The ancient use of perishable materials is further confirmed through the recovered fragments of preserved “perishable” materials from bogs, cave sites, cenotes, and other contexts (Adams 1983, 1984; Brady 1989, 1995; Coggins and Shane 1984; Drooker 2001; Hall 1987; Shafer and Hester 1990; Meadows 2001; Sheets 1992). Due to the absence of perishable materials, the cultural, social, and economic implications as revealed through contextual patterning may not reflect the true significance of any artifact or artifact class. Their absence may also affect the social implications of burials and the interpretations of caches.

RESEARCH OBJECTIVES

One of the products of culture is its material remains, archaeologically referred to as material culture. Through material culture analysis, archaeologists seek to identify intangible aspects of culture. In the Maya area, material culture has predominantly been used to establish site chronologies, boundaries, social hierarchies, and to identify exchange networks and technological systems (Adams 1974; Gifford 1965; Guderjan and Garber 1995; Hester 1985b; Hester and Shafer 1989, 1994a; Shafer and Hester 1986; Hirth 1984;Valdez 1987). More recent analytical approaches have focused on the reconstruction of social communities in which material culture is viewed as symbols that serve to construct, illustrate, and reinforce individual and community identities and ideologies (Aizpurúa and McAnany 1999; Canuto and Yaeger 2000; Hester and Shafer 1994a; McAnany 1991; Meadows 2000).

When material culture is viewed from a contextual perspective, aspects of cultural behavior may be illuminated. Within a framework of this behavior, patterns of material culture consumption and disposal may be isolated (Garber 1989; Hester and Shafer 1994a). In turn, this may reveal specific behavioral practices that serve to reinforce individual and community identities, affiliations, and ideologies.

This analysis centers around four broad research objectives that were designed specifically for the grouping of artifacts included in this assemblage. The four broad research objectives are to 1) analyze the materials contextually so that any contextual patterning would be revealed, 2) propose artifacts function(s), 3) link any contextual patterns to the culture history of Colha, and 4) develop a presentation system that is useful as a comparative tool. Each of these research objectives is discussed in specific detail below. The theoretical component of these objectives is elaborated on in Chapter Two.

In order to address these objectives it was first necessary to establish a typology based on raw material, technology, and morphology. This first step is often the extent to which this category of artifacts is addressed in site reports and monographs. It a goal of this dissertation to demonstrate that through contextual analysis this class of artifacts can provide significant data regarding cultural behavior and thereby cultural and social systems.

Research Objective One: Contextual Analysis and Patterning

Although a traditional metric and attribute analysis is incorporated, the primary goal of this study is to place and analyze each artifact in its archaeological context. In doing so, any contextual patterning represented in the assemblage should become discernable. The resulting patterns should enable suppositions regarding the behaviors responsible for the deposition of the select portable material culture of Colha. Inter-site comparisons are used to establish regional depositional patterns or trends.

The identification of patterned behaviors should reveal those practices that serve to establish and reinforce individual and community identities, affiliations, and ideologies at Colha. Thus providing a path for making inferences regarding the social and cultural significance of the select portable material culture of Colha.

Research Objective Two: Establishing Artifact Function(s)

Through an attribute-based analysis an artifact typology was developed. Attribute patterning was utilized to develop form and subform categories. In several cases the form categories correspond to previously established functional assignments. Through contextual analysis and inter-site comparisons, statements regarding artifact function(s) for the Colha assemblage are posited. The Colha assemblage will also be used to further solidify and to suggest alternative and/or additional functions to those artifacts with previously ascribed functions.

Research Objective Three: Linking Contextual Patterns to the Culture History of Colha

Another objective of this dissertation is to link the contextual patterns, depositional behaviors, and artifact functions revealed in this analysis to the culture history of Colha. The select portable material culture of Colha is comprised of artifacts from all Maya occupational phases of the site (Preclassic to Postclassic). A cultural-historical overview covering all phases of Maya occupation is presented to provide a point of reference for linking patterns revealed in the analysis with those represented in the culture history.

Research Objective Four: Presentation of Data

This dissertation provides a presentation system that relays information in a structured format that is useful as a comparative tool. This is by no means an attempt to criticize earlier analysis strategies, but rather to build upon those aspects that make them useful as comparative tools. The analysis data is provided in table form where possible. The purpose for doing this is to provide information beyond description that can be used for comparative purposes. Another component of this fourth objective is to define the analytical and theoretical terms as they are applied in this analysis.

ORGANIZATION OF THE DISSERTATION

This dissertation is comprised of 11 chapters. The present chapter, Chapter 1**,** is a general introduction to the assemblage. It also reviews the analysis strategies and methods that were applied in this study. The second part of Chapter One is dedicated to providing a chronological review of archaeological investigations at Colha. Following this review is a listing of bibliographic references (of published and unpublished works) of the Colha Project.

Chapter 2 starts by providing a definition and classification of material culture. The second part of this chapter outlines and defines the theoretical framework in which the select portable material culture of Colha are analyzed. In doing so a review of various approaches and methods used in the analysis of material culture including those applied in this study are reviewed. In particular is a review of contextual, attribute, and technological analysis and contextual and attribute patterning.

In the remainder of Chapter 2, it is established that material culture is not culture, it is the product of cultural behavior. A starting point for viewing this behavior is found in the cultural and non-cultural formation processes of the archaeological record. These processes are outlined and are supported by examples from the archaeological record at Colha.

Chapter 3 places the site of Colha into an environmental context. In doing so, biophysical environmental information is provided for the Maya area. This data is organized and presented according to the subdivisions found within the two heterogeneous zones of the Maya area, highlands and lowlands. Presented for the individuals subdivisions are generalized descriptions of the physical characteristics that define each. It concludes with a focus on the biophysical environment of Colha and Cobweb Swamp.

Chapter 4 focuses on a describing the cultural history of Colha. This review is presented by phases of occupation, as established primarily by the ceramic chronology. Cultural and settlement patterns are also used to further define each phase. This chapter additionally seeks to establish a cultural context in which the results of the analysis of the portable material cultural may be presented and discussed. On a broader level, Chapter 4 provides a point of reference for linking patterns revealed in the material culture analysis with those represented in the culture history of Colha.

Chapters 5 through 10 present the results of the contextual analysis of the select portable material culture of Colha. Each chapter is presented according to raw material. The exception is Chapter 10 that includes raw materials that are highly under represented.

Within the raw material categories are subcategories that are based on production methods and raw material variance. The artifacts are presented according to form and subform categories. The individual artifacts are presented temporally along with their corresponding metric, attribute, context, and physical description data. Inter-site comparisons are provided for each form and subform categories. Upon the conclusion of the attribute analysis data each chapter presents the contextual distribution and temporal trends that were revealed in the analysis.

Chapter 11 is comprised of two sections. The first section presents a summary of the contextual patterns and trends of the assemblage according to phase of occupation. The second section will link the patterns and/or trends to those found in the culture history of Colha. The overall purpose of this chapter is to demonstrate that contextual analysis provides a path for revealing the social and cultural implications of an assemblage such as the one examined here.

ANALYSIS STRATEGIES

The general analysis methods applied were adapted and modified from those used in previous analysis of "small finds" assemblages (Garber 1981, 1989; Lee 1969; Moholy-Nagy 1994; Sheets 1978; Willey 1972, 1978; Willey et al. 1965, 1994). Where possible, each artifact in the assemblage was examined and a pre-determined set of attributes was recorded. Attribute data for those artifacts that were unavailable for examination was obtained from laboratory records, photographs, illustrations, and field notes. Descriptions of any distinguishing or unusual characteristics of the individual artifacts are also provided.

The analysis began by sorting the individual artifacts into raw material groupings. It is recognized that variability within raw material categories exists. For this reason, sub-categories of raw materials were established. This is best illustrated in the raw material category of stone. Within this grouping are found several varieties of stone corresponding to geological formation patterns including greenstone, limestone, schist, and pyrite.

Within the raw material groups and subgroups, form categories were established corresponding to production technology, morphology, and function. In the majority of cases, the form categories do not represent true morphological types but rather descriptive functional classes of artifacts. Functional assignments are based upon previously established functional types and are confirmed through inter-site comparisons and context.

At the form level, individual artifacts were analyzed and metric data obtained. Using this data allowed for further refinement of the form categories and the establishment of subform classifications. It is at the form or subform level that the artifacts are presented and discussed under their corresponding raw material group or subgroup.

Within each form and subform categories, the range of attributes that define each are presented. Additional data presented in table format include provenience, context, temporal affiliations, and metrics. A comments field is utilized to present relevant descriptive data. Information regarding material and production technologies is presented where possible. Details regarding how these data were obtained are provided below. Inter-site comparisons are provided for all form categories where possible.

Provenience Data

Provenience data is presented for the individual artifacts where available. An abbreviated form of provenience (Prov.) is used to distinguish this data in the artifact tables. The site of Colha was divided into four quadrants, 1000, 2000, 3000, and 4000 (Figure 1.2). Operation numbers were assigned to excavation areas according to their positioning within these quadrants. The method for recording and providing provenience information is as follows, Operation, Suboperation, and Lot. An example of this method is 2031 10:5. Thus 2031 represents the Operation, 10 the Suboperation, and 5 is the lot.

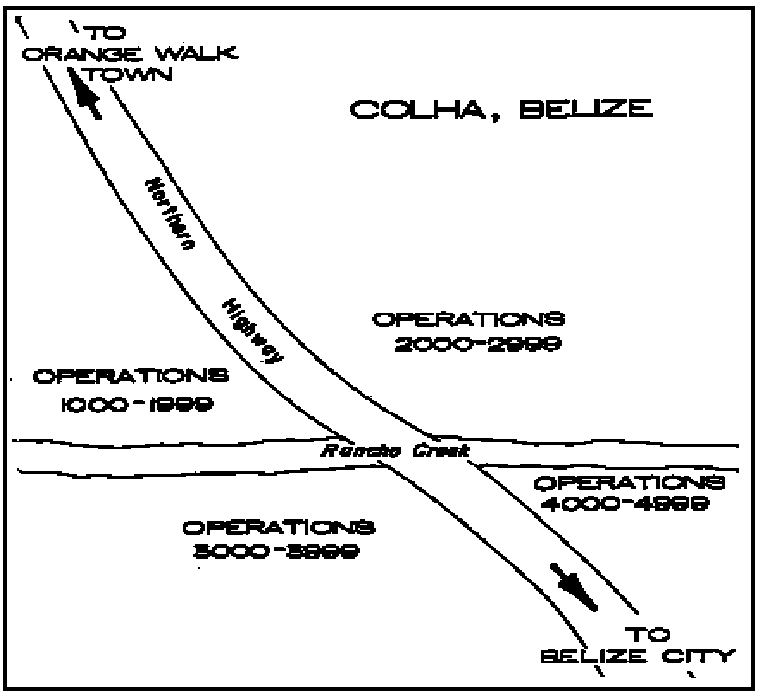


Figure 1.2. Excavation quadrants of Colha (after Stock 1979)

Stratigraphic control was maintained through a modified version of the Harris Matrix system (Harris 1979). Three terms were generally used to define this system, lot, strat, and level. For the sake of brevity the word lot is utilized to describe this system as it was applied at Colha. When using the lot system, a lot can be whatever the excavator defines it to be. Therefore a lot may be defined as cultural, non-cultural, stratigraphic, or arbitrary. When describing an arbitrary level the number is prefixed with an L (ex. 2012 12:L2).

Burial (Bn) and Feature (Fn) numbers were utilized and assigned at the operation level. Burial numbers were assigned to individual burials. Feature numbers (Fn) were provided to cultural deposits such as caches and special deposits. These numbers were assigned in the field and were used in conjunction with lot numbers. Features and burials may include multiple lots.

Contextual Assignments

Contextual information was obtained from Colha reports, original lot record forms, field notes, and through personal communications. It should be noted that contextual information was not available for all artifacts included in this study. Items lacking contextual data are designated as of "unknown" context. When presenting the contextual distributions of the artifact subforms, the term "construction related contexts" is used to refer to construction fill, rubble, floor, and subfloor contexts.

Temporal Assignments

Where possible, each artifact is ascribed temporal status. Temporal data were obtained through associated ceramics, lithic comparisons, and carbon 14 assays. The ceramics were analyzed using a modified version of the type:variety-mode analysis system (Adams and Valdez 1980, Valdez and Adams 1982; Valdez 1987, 1994). The following abbreviations are utilized for temporal affiliations, early Middle Preclassic (eMPC), late Middle Preclassic (lMPC), Late Preclassic (LPC), Protoclassic (PRC), Early Classic (EC), Late Classic, (LC) Terminal Classic (TC), early Postclassic (EPC), middle Postclassic (MPC), and finally and a general Postclassic (PC) category.

Metric Data

Measurements were obtained using hand held digital calipers and are presented in centimeters (cm). Weights are presented in grams and were acquired through the use of a digital scale. The following abbreviation scheme is used in the presentation of metric data, (L) length, (W) width, (Th) thickness, (D) diameter, (PD) perforation diameter, and (Wt) weight.

Material Identification

The Colha assemblage includes a wide variety of raw materials whose identification required assistance and/or relied on earlier identifications. Much of the shell was previously identified by Meredith Dreiss (1987; 1994) and Janet Stock (1979). Jane Driesler, Curator of Science, Corpus Christi Museum (1990, personal communication) provided information for the 1989 Colha Preclassic

Project marine shell and vertebrae. The Preclassic fauna assemblage, including modified bone, was analyzed and identified by Leslie Shaw (1991a). The Early Postclassic fauna was analyzed by Leslie Shaw and Patricia Mangan (1994:69). In the case of burials, gender identifications were provided by Lori Wright (n.d.a, n.d.b) and Dianne Young (Young 1994:59, n.d). Dr. Thomas R. Hester provided much needed assistance in the identification of stone tool-working implements.

A HISTORY OF ARCHAEOLOGICAL RESEARCH AT COLHA

The purpose of this section is to provide the reader with a general overview of the various seasons of investigations that were responsible for producing the material analyzed in this study. This discussion will provide a chronological review of archaeological investigations conducted under the auspices of the Colha Project.

As will be observed, the site of Colha has a long and diverse history of multi-disciplinary investigations. The results have contributed to the understanding of the prehistoric environment, the people that inhabited and manipulated it, the cultural and economic systems that sustained it, and the material culture that functioned within it. The record indicates prehistoric human manipulation of the area as early as 3400 B.C. and as late as A.D. 1400 (Hester 1996; Iceland 1997; Jacob 1992; Jones 1994b; Valdez 1994). This long history of occupation provides researchers the unique opportunity to view ecological, cultural, and material culture changes as they are manifested over a 2,000 year period.

The direct and indirect results of these efforts are found in site reports, published articles, papers presented at conferences, master's theses, and doctoral dissertations. A brief review of these works, in bibliographic form, is provided as this study relies and builds upon many of these efforts. This in turn will provide the reader the necessary references for further inquiry into the many facets of prehistoric Colha.

Overview of the History of Archaeological Research at Colha

The site of Colha was first reported, named, mapped, and tested in 1973 as part of the British Museum-Cambridge University Corozal Project headed by Norman Hammond (1973). The 1975 season of the project brought with it additional testing efforts at Colha (Hammond 1973, 1976, 1982; Wilk 1973, 1975, 1976). The survey and testing activities uncovered the presence of large deposits of chert debitage and provided ceramic data that revealed a long occupational sequence for the site (Hammond 1973; Wilk 1976).

In 1976, during the first Maya Lithic Conference, the site of Colha and its potential for providing information regarding ancient Maya lithic technology and craft specialization was acknowledged and addressed (Hester and Hammond 1976). Part of the outcome of the conference was that the site of Colha warranted long-term intensive investigation (Hester and Hammond 1976). It was then suggested that Thomas R. Hester and Harry J. Shafer, because of their expertise in lithic technology, take the task of investigating the site (Hester et al: 1979:2).

What follows is a chronological review of the 14 seasons of archaeological research conducted under the umbrella of the “Colha Project”, which was founded in 1979 and co-directed by Thomas R. Hester and Harry J. Shafer. The following information is provided for each season of investigation: 1) project director(s), 2) research goals, and where available, 3) interim report or project summary references.

The first season of the Colha Project was initiated in 1979, under the direction of Thomas R. Hester, Harry J. Shafer, and Robert F. Heizer and co-directors, R.E.W. Adams, Jack D. Eaton, and Giancarlo Ligabue (Hester et al. 1979). The major focus of this season was an intensive investigation of the numerous lithic workshops. The goal was to obtain a better understanding of craft specialization as well as the development and role of Colha as a center of economic importance. Other research interests included survey, mapping, and testing of various types of structures. The results of the 1979 efforts are found in Hester (1979) and Hester et al. (1979:1-8).

One of the first steps of the initial season was to divide the site into manageable units for both the field and laboratory cataloging systems (Stock 1980b). Four quadrants were established, 1000, 2000, 3,000 and 4,000, (see Figure

1.2). Excavations within each quadrant were provided a unique operation number. The Colha field management system is discussed in greater detail in Chapter 5.

Excavations during this two-month season were conducted in the 1000 and 2000 quadrants and included: lithic workshops, residences, and a plazuela group. The complexity and diversity of the site became more apparent through the extensive survey and mapping efforts of Kelly and Valdez (1979a). Survey activities were also conducted outside the confines of Colha as part of a regional survey program (Kelly 1979; Kelly and Valdez 1979b, 1979c). As a result of this first season, Adams and Valdez (1979) were able to establish a preliminary ceramic chronology.

Efforts of the 1980 season were under the direction of Thomas R. Hester, Harry J. Shafer, Giancarlo Ligabue, Jack D. Eaton, and Richard E. W. Adams. The results of the 1980 season are presented in Hester et al (1980). The importance of Colha as a center of intensive craft specialization was confirmed by the end of this season (Hester et al. 1980).

In addition to the continued investigations of lithic workshops, this season saw a concentrated effort toward the recovery of data pertinent to understanding the Maya community that was Colha. This included the excavation of domestic and elite residences, a ballcourt, and a temple platform. A significant part of the excavation effort was concentrated in the site core at Operations 2009, 2011, and 2012 (Eaton 1980b; Eaton and Kunstler 1980; Potter 1980).

Survey activities continued and were again expanded beyond the borders of Colha (Kelly 1980). This program of inquiry became known as the Colha Regional Survey (CRS). The CRS was responsible for the discovery of several Preceramic sites including Ladyville, Lowe Ranch, and Sand Hill. The findings of the Colha Regional Survey may be found in Shafer, Hester, and Kelly (1980a, 1980b).

The efforts begun during the first two seasons were continued and expanded during the 1981 and 1983 season under the direction of Thomas R. Hester, Harry J. Shafer, Jack D. Eaton, and Richard E. W. Adams. The results of the 1981 season are found in Hester, Shafer, and Eaton (1982) and the 1983 season in Hester (1983) and Hester, Shafer, and Eaton (1994).

The 1981 season focused on the recovery of data regarding lithic technology and craft specialization (Gibson 1982a; Hester 1982; Roemer 1982; Shafer 1982b). Excavations at the site core, Operations 1002, 2012, 2025, and 2031 (formerly designated 2011), continued to focus on the Colha community (Eaton 1982a, 1982b; Gibson 1982a; Potter 1982). Survey and mapping efforts were conducted at Colha and beyond as part of the CRS (Kelly 1982).

By the end of the 1981 season significant information had been collected and processed regarding the control and distribution of lithic craft specialization (Shafer 1982b:31-38). It also made possible the establishment of a lithic chronological sequence for the northern Belize area (Hester 1982:39-59; 1985b).

In addition, the ceramic data obtained from the three seasons enabled Valdez and Adams (1982:21-30) to solidify the Preclassic to Postclassic ceramic chronology.

Efforts of the 1983 season were by far the greatest in terms of number of excavators and areas of investigation (Hester 1983, 1994:7, 1996). According to Hester (1994: 1) “the goals of the 1983 fieldwork at Colha were varied but were largely designed to explore various facets of the ancient Maya community at the site.” This included inquiries into the Preclassic community as well as addressing issues of the Late Classic to Postclassic transition and the Classic Maya collapse (Hester 1983, 1985a).

In general, the results of the previous seasons allowed investigators to focus in on specific research questions. Research objectives of this season included 1) the recovery of data regarding the early Middle Preclassic component at Operation 2031, 2) the transition from domestic to ritual space at Operation 2012, 3) settlement pattern survey (addressing Late Classic settlement), and 4) off-mound testing for “hidden structures” (Hester 1994:10). In total, eight excavation areas were under intense archaeological investigation.

In 1984 a brief season of excavation and mapping was conducted by Thomas R. Hester, Harry J. Shafer, and Jack D. Eaton. The main focus of this season was to gain additional data regarding the Late Classic to Postclassic transition through excavation and settlement survey (Hester 1994). Excavations were confined to Operations 2037 and 2040, the results being reported in Hester

(1985) and Michaels and Shafer (1994:117-128). The results of the settlement survey are found in King (1994:17-24, 2000).

After a one-year hiatus, the project returned in 1986 under the direction of Thomas R. Hester and Harry J. Shafer. The efforts of the previous seasons had enabled a greater understanding of the Preclassic settlement and the origins of craft-specialization at Colha (Hester and Shafer 1994; King and Potter 1994). However, questions regarding the Late Classic component still remained unanswered (King 2000: 124-125). Therefore, this season saw a concentrated effort towards the recovery of data that would aid in defining Late Classic settlement and organization of lithic production (King 2000:126). In addition, research continued to investigate the issue of the Late Classic to Postclassic transition. In this vein, excavations were conducted in the 4000 quadrant.

The 1987 season, directed by Thomas R. Hester, Harry J. Shafer, and with Eleanor King as field director, was a continuation and expansion of the efforts initiated during 1986. In addition, this season marked the initial investigations into the previously identified (Operation 4046) Preceramic component of the site (Wood 1990). It also marked the inception of the Colha Preceramic Project, which would continue with multi-disciplinary investigations of the Preceramic component for another five seasons. This initial effort was concerned with obtaining stratigraphically controlled samples of lithic material in order to define the Preceramic lithic assemblage. It was also during this season that soil scientist John

Jacobs (1992) began his inquiry into the soils and sediments of the wetland area of Cobweb swamp.

In 1988, Greg Wood under the direction of Thomas R. Hester and as part of the research efforts of the Colha Preceramic Project initiated a testing program at Operation 4046. This season was brief and limited to pursuing the Preceramic component. The results of these efforts may be found in Wood (1990).

The summer of 1989 was the next season of research with the Colha Preclassic Project. The research project was directed by Fred Valdez, Jr., Daniel R. Potter, and Thomas R. Hester, and complemented with The University of Texas at Austin Archaeological Field School directed by Fred Valdez, Jr. The main focus of this season was to obtain information concerning the Preclassic occupation at the main plaza (Sullivan 1991a, 1991b; Valdez in prep). This inquiry was confined to Operation 2031 where broad horizontal units expanded upon previous excavations known to contain Middle and Late Preclassic occupation (Anthony 1987; Sullivan 1991a).

Two additional research inquiries were also supported by the 1989 season. This included limited excavations at Operation 4046 by Greg Wood (1990) as part of the continued efforts of the Colha Preceramic Project directed by Thomas R. Hester. It was also at this time that John Jacob (1992), through coring efforts, obtained soil and sediment samples from Cobweb Swamp.

An interim report summarizing the 1989 findings is currently in preparation (Valdez in prep). A summary of excavation efforts may be found in Sullivan (1991a, 1991b), of select portable material culture in Buttles (1992), and of the ossuary remains in Foster (1997).

Work at Colha during 1990 was confined to the area in-and-around Cobweb Swamp. Efforts were limited to coring for soil and sediment samples. The work was performed under the archaeological permit issued to Thomas R. Hester and the field direction of soil scientist John Jacobs and palynologist John Jones. These efforts were part of the ongoing investigation into the agroecological and palynological record of the area. A summary of these efforts is in Jacob (1992) and Jones (1991).

In the summer of 1991, under the support of The University of Texas Archaeological Field School directed by Fred Valdez, Jr., archaeological investigation of the Preceramic component at Operation 4046 resumed. This work was conducted by Jon Lohse and Thomas Kelly, under the direction of Thomas R. Hester, and was part of the ongoing efforts of the Colha Preceramic Project (Lohse 1993, 1995).

The 1993 season marked the return of intensive archaeological investigation at Colha under the auspices of the Colha Preceramic Project. As the name implies, the focus of this and the following 1994 season was to gain further data regarding the Preceramic occupation of the site. Research efforts for both seasons were conducted under the direction of Thomas R. Hester, Harry J. Shafer, and field director Harry Iceland. Excavations were conducted at Operation 4046 and at the main plaza at Operation 2031 (Anthony n.d.).

Another component of the 1993 season was the introduction of geoarchaeological investigations by Paul Goldberg (Goldberg and Jacob 1994). This data along with the ecological information collected by John Jacob (1992) and John Jones (1991) at Cobweb Swamp served to supplement the archaeological findings. A summary of the research efforts of the Colha Preceramic Project may be found in Hester et al. (1996) and Iceland (1997).

In 1997 under the permit and direction of Thomas R. Hester, Richard Meadows, then a University of Texas at Austin graduate student, conducted a survey and mapping project at the site of Chicawate. The focus of this project was two-fold. First, was to relocate the site (of Chicawate) and second, to map the visible structures in order to gain an understanding of structure density. A report of these efforts is found in Meadows (1998b).

As has been presented, the site of Colha has had a long and diverse history of multi-disciplinary investigation. Since its original recording in 1973, 16 seasons of research, 14 as part of the Colha Project, have been conducted at the site. Each season has contributed to the understanding of the prehistoric record of this long-occupied site.

Within this 22 year period, a number of honor's theses, master's theses, doctoral dissertations, published articles, and conference papers have reported on Colha's prehistoric environment, the people who inhabited and manipulated the area, the cultural and economic systems that sustained Colha, and the material culture that functioned within the site. The present study draws upon and incorporates the analyses and results of many of these works.

As a service to the reader, a compilation of these works (published and unpublished) is provided below in bibliographic format (Tables 1.1, 1.2, and 1.3). The three tables are organized by topic and include: Table 1.1, general Colha bibliography, Table 1.2 material culture studies, and Table 1.3 environmental studies. Further divisions have been made within the individual tables. Several references, denoted by an asterisk (*), summarize findings from sites other than Colha as the work/research was either funded by the Colha Project or was part of the endeavors of the Colha Regional Survey.

Table 1.1. General Colha Bibliography

Topic	References
Project Interim Reports, Summaries	Hester 1979a, 1980, 1983a, 1983b, 1985a, 1985c, 1994; Hester, Eaton, and Shafer 1980, Hester, Shafer and Eaton 1982, 1994; Hester and Shafer 1991b 1994b; Hester et al 1979a, 1979b, 1980, 1982, 1983,1996; King 1987; Valdez in prep; Valdez and Hester 1990

Table 1.1. General Colha Bibliography (continued)

General Colha (Household, Community, Ritual, and Ideology)	Adams 1982, 1983b; Anthony n.d.; Anthony and Black 1994; Bareiss 1980; Barrett and Scherer 2002.; Day and Laurens 1980; Eaton 1980b, 1982b, 1991, 1994; Eaton and Kunstler 1980; Escobedo 1979, 1980a; Gibson 1982a, 1982b*,1994*; Gibson and Shafer 1982*; Hammond 1982b; Hester 1983c, 1983d*; Hester and Shafer 1994a; King 1990; King and Potter 1994; Knepper 1994; Kuntsler n.d.; Ligabue 1983; Masson 1991; McAnany 1994; Meadows and Wilson 1997; Meskill 1988; Michaels 1994a; Mock 1991, 1994a, 1998; Potter 1980, 1982, 1985, 1991b, 1992, 1994; Potter et al. 1984, n.d.; Potter and King 1995; Scott 1980b; Stock 1982; Sullivan 1991a, 1991b, in prep; Taylor 1980a, 198b; Valdez 1989, 1990, 1994b, 1994c, 1996; Valdez and Meskill 1991; Valdez and Potter 1982
Field and Laboratory Methodologies	Black 1991; Buttles in prep; Selsor 1982; Stock 1979a, 1980
Settlement Studies	Eaton 1980a, 1982a; Gibson 1982b, 1982d; Kelly 1979a, 1980; Kelly and Valdez 1979a, 1979b, 1979c; King 1985, 1986, 1994; Larralde 1994; McNatt and Cox 1979;

Table 1.2. Material Culture Studies

Topic	**References**
Architecture	Anthony 1987; Basaglia 1983; Eaton 1979, 1980a; 1981, 1982a; Sullivan 1991
Ceramics	Adams and Valdez 1979a, 1979b, 1980a, 1980b, 1983; Buttles 1994a; Hurst et al. 2002; Johnson 1992; Meskill 1991, 1992; Mock 1994b; Mock and Valdez 1989*; Powis et al 2002; Reese 1991; Reese and Valdez 1985*, 1987*; Valdez 1984, 1985, 1987, 1988, 1991a, 1993, 1994a, 1997, in prep; Valdez and Adams 1982; Valdez and Mock 1985a, 1985b, 1991*; Valdez and Meskill 1991a, 1991b; Valdez, Reese, and Meskill 1993; Valdez, Sullivan, and McDow 2000, 2001

Table 1.2. Material Culture Studies (continued)

Faunal and Subsistence Strategies	Huebner and Krueger 1992, Scott 1979, 1980a, 1982, 1983; Shaw 1985, 1990, 1991a, 1991b, 1999; Shaw and Mangan 1994; Sires n.d.
Maya Lithics (Technology, Craft Specialization, Economic, and Culture)	Barrett 1999, 2000; Cackler et al. 1998; Drollinger 1989; Eaton 1982b*; Eaton, Hester, and Valdez 1994; Escobedo 1979, 1980b; Gibson 1982c, 1986, 1989; Hester 1982; 1983e; 1985b, 1993, 1994, 1996; Hester, Shafer, and Ligabue 1980; Hester et al. 1993, 1996; Hester and Shafer 1984, 1987, 1989, 1991a, 1992, 1994; Iceland and Johnson 1996; Johnson and Canty 1981; Kelly 1993; Kelly, Valdez, and Hester 1979; King 2000; Labadie and Suhler 1982; Lamb 1979; Masson 1989, 1991, 2000; Masson and Maslyk 1988, 1990; McAnany and Barnett 1991; Meadows 1998a, 1998b*; 2001; Meadows and Wilson 1997; Meskill 1988; Michaels 1986, 1987, 1989, 1991, 1994b; Michaels and Shafer 1994; Mitchum and King 1990; Mock and Johnson n.d.; Nash 1980, 1986; Potter 1991a, 1993; Roemer 1979, 1980, 1982, 1984, 1991a, 1991b; Santone 1993; Shafer 1976, 1979, 1982a, 1982b*, 1983a, 1983b, 1984, 1985,1986,1991, 1994a, 1994b; Shafer and Hester 1979, 1983, 1986, 1991a 1991b, 1991c,1996; Shafer, Hester, and Kelly 1980; Shafer and Oglesby 1980; Suhler 1983; Tobey 1986; Toby, Shafer, and Rowe 1994; Toy 1983
Obsidian	Brown, Dreiss, and Hughes n.d.; Dreiss 1988, 1989; Dreiss et al. 1988; Dreiss and Brown 1989, 1991; Hester and Michel 1980; Hester and Shafer 1980; Houk and Valdez in prep; McGraw 1980; Woerner 1980
Osteology	Foster 1997; Hester, Steele, and Eaton 1983; Massey 1989, 1991, 1994; Massey and Steele 1982; Meadows and Wilson 1997; Scherer n.d.; Scott 1980b; Steele, Eaton, and Taylor 1980; Wright n.d.a, n.d.b; Young 1994, n.d.
Preceramic Lithics	Gibson 1985, 1991, 1994; Hester et al. 1981; Hester and Iceland 2001; Hester et al. 1993; Hudler and Lohse 1994; Hudler et al. 1996; Iceland 1997; Iceland and Hester 1996; Iceland et al 1995; Kelly 1991*, 1993*; Lohse 1993, 1995; Shafer, Hester, and Kelly 1980a*, 1980b*; Wilson, Hester, and Iceland 1998; Wood 1990, 1991

Table 1.2. Material Culture Studies (continued)

Ground and Polished Stone	Buttles 1991, 1992a, 1992b, in prep; Johnson n.d.
Limestone	Buttles 1992a, 1992b, 1994b, in prep*
Modified Bone and Antler	Buttles 1991, 1992a, 1992b, in prep; Scott 1980; Shults n.d.; Stock 1979b
Reworked Ceramic Sherds	Buttles 1991, 1992a, 1992b, 1994b*, in prep; Gillis 1982; McGregor 1994; Valdez and Gillis 1980
Modified Shell	Buttles 1991, 1992a, 1992b, in prep; Dreiss 1982, 1994; Stock 1979c
Molluscan Remains, unmodified	Feldman 1979, 1980, 1994

Table 1.3. Environmental Studies

Environmental Studies	References
Agroecology Geoarchaeology, Palynology, and Botanical	Alcala-Herrera et al. 1994; Caldwell 1980; Cox 1979; Goldberg 1994; Iceland and Hester 1996; Jacob 1991, 1992, 1995; Jones 1991, 1994a, 1994b; King 1993; Miksicek 1979; Valdez, Jacob, and Jones 1991

CHAPTER 2

EXAMINING MATERIAL CULTURE

The purpose of this chapter is to outline and define the theoretical framework in which the select portable material culture of Colha are analyzed. In doing so, a review of various methods and models as they are applied to the analysis of material culture are presented. In this review a common unifying principle is found in that material culture is not culture, but is the product of cultural, and social behavior. Thus a starting point for understanding prehistoric cultures and their society is found in the analysis of their material remains.

Archaeologists through varying frameworks, methods, models, theories, techniques etc., seek to understand the relationship between prehistoric cultures and their material remains (e.g. Chilton 1999b). The "best" method or path leading to this information is and may always be debatable (see Chilton 1999b; Dietler and Herbich 1998; Stark 1999). As will be illustrated a major factor influencing the analytical approach is the material itself.

Affecting the depositional record and thereby the associated material culture is the cultural and non-cultural formation processes. Identifying these processes brings forth the variability inherent in that record. Within a framework of this variability, assumptions regarding depositional behavior and thereby context may be formulated. Hence, at a minimum archaeologists should be able to contribute to the understanding of the cultural and non-cultural formation processes of the archaeological record.

Taking into account the variability of the depositional record, a subsequent step would be to recognize the variability of the material culture itself. This may be achieved by one of the most basic levels of analysis, the isolation of attributes. Through attribute patterning, those aspects of artifacts and artifacts classes, which may hold cultural and/or social significance, may be revealed. When combined with contextual data and patterning and inter-site comparison, suppositions regarding artifact function(s) may be posited.

DEFINING AND ANLYZING MATERIAL CULTURE

Material culture can be divided into three basic categories based on size and portability, 1) permanent, 2) semi-permanent, 3) semi-portable, and 4) portable. Permanent material culture includes architecture. Semi-permanent remains include freestanding monuments or monumental carvings such as altars and stelae. These items are classified as semi-permanent because, although they are large and quite heavy, their physical position can be modified. However, their movement probably required the assistance of multiple persons. Semi-portable objects are items that are transportable, but not easily so due to size and weight. One or two individuals may achieve movement. Included in this category are items such as metates and smaller freestanding monuments. Portable items may move freely through the action of a single person and are categorized (as such) on the basis of their size, shape, and weight. Their portability significantly accounts for the great raw material variability.

Because material culture is the direct product of human action and interaction, possible past behavioral and communication systems may be revealed through its analysis. Schiffer (1999:12) identifies three types of interactions: 1) people, 2) artifacts, and 3) externs. People are defined as individuals belonging to the species *Homo sapiens*. Artifacts are phenomena produced, replicated, or otherwise brought wholly or partly to their present form through human means. Finally, are the residual interactions of externs, which are defined as the "phenomena that arise independently of people, like sunlight, clouds, wild plants and animals, rocks and minerals, and landforms" (Schiffer 1999:5). However, it should be noted that externs could become artifacts when they are brought into the interaction system by human means.

It is generally thought that imprinted during the life history or life cycle of any given artifact are traces of its production, use, discard, re-use, and finally its deposition into the archaeological record (Shott and Sillitoe 2001). Artifacts are not always disposed of at the end of a life cycle and at any time can re-enter the life cycle process. An example is found in the recycling of artifacts. Thus, a previously manufactured artifact may re-enter the production phase and begin a new life cycle. Since depositional and post depositional processes are the last stages in an artifact's (prehistoric) life cycle, its identification should be the first step in analysis. This identification starts with defining the context at the artifact and unit level.

Contextual Analysis

For much of the last century, material culture analysis was limited to detailed descriptions of artifacts often without discussion of context. Today's trend toward contextual analysis has enabled archaeologists to move from description to interpretation. Context, when viewed as an analytical tool, provides a method for determining possible meaning(s). So, what constitutes context? According to Butzer (1980:418), archaeological "context implies a four-dimensional, spatial-temporal matrix that comprises both a cultural and non-cultural environment, and that can apply to a single artifact or to a constellation of sites." Butzer's view of context is geared toward the interaction of humans to the ecosystem.

Hodder (1999:31-33; 1991:121-155) has provided another view of context that is grounded in hermeneutics. For Hodder, context starts with the definition of boundaries that occur when a lack of significant similarities and/or differences occur (Hodder 1991:143). However, he also holds that boundaries are dependent on the interpretation of the context. Thus "the meaning of a part derives from its relationship to a whole, while the whole is understood from the relationship between the parts" (Hodder 1999:32-33).

Schiffer (1987:3) who aligns his definition with Butzer differentiates two types of context, 1) systemic and 2) archaeological. Items in systemic context are artifacts that participate or interact in a behavioral system. Archaeological context refers to artifacts that interact only with the natural environment. Material culture can move freely between these two types of context and is not bound by space or time. Determining how artifacts functioned in systemic context is a major goal of archaeological analysis.

Contextual analysis in conjunction with spatial temporal patterning enables suppositions regarding the behavior(s) that were responsible for bringing the Colha portable material culture into the archaeological record. As previously stated, the variability inherent in this record is best revealed through an examination of both cultural and non-cultural formation processes.

Independent of contextual patterning is the social and cultural significance of material culture. This information is best captured when individual artifacts and their contexts are examined for contextual temporal patterning and attribute patterning. The resulting data should enable the discovery of those aspects of artifacts and/or artifact classes as well as their context, which may hold cultural and/or social significance. Thus leading to an understanding of intangible aspects of culture as they are reflected in the select portable material culture of Colha. It is in this vein that the selected portable material culture of Colha are examined.

Contextual Patterning

One of the goals of archaeology is to bring meaning to material culture. A starting point can be found in contextual patterning. According to Webster's (1996) dictionary the term pattern is defined as a "combination of qualities, acts, tendencies, etc., forming a consistent or characteristic arrangement". Thus, patterns are a reflection of their context and the formation processes that brought them into the archaeological record. Patterns independent of context may be found at the artifact level through the identification of attribute patterning.

If one follows Webster's definition, a contextual pattern can be inferred from a repeatable method or style as it applies to human internment, caching, architecture, etc. For example, during the Middle Preclassic at Colha, burials are interred with furniture (artifacts) that is both similar in style, material, and placement. This similarity or repeatable internment type represents a pattern at Colha. Contemporary burials from sites within the lowland Maya area may also exhibit this pattern. The combined multi-site patterning would then be defined as a horizon marker for the Middle Preclassic of the lowland Maya area.

So, what constitutes contextual patterning at a site or regional level? I have suggested a framework comprised of three stages for establishing a pattern: 1) initial, 2) repeatable, and 3) defined (Figure 2.1). The initial stage can apply to any artifact. At the repeatable stage, a pattern is shown to be contextually repeatable if it occurs more than twice. The final stage is the definition of a pattern.

Figure 2.1. Stages for Determining Contextual Patterning

Initial → **Repeatable** → **Defined**

Examining these patterns both temporally and contextually provides an excellent way to view depositional behaviors as they change through time and space. It should be noted that patterns revealed in the archaeological record do not take into account the existence of items that may have been manufactured from perishable materials and are not preserved in the archaeological record.

Attribute Analysis and Patterning

Specific analysis methods or models are often designed around (or are dependent upon), a collection of artifacts being constructed from one single type of raw material such as stone tools or ceramics (see Chilton 1999a; Dietler and Herbich 1998; Hayden 1998). The select portable material culture assemblage of Colha is comprised of several varieties of raw materials and within each are found several artifact forms and subforms. Furthermore, a variety of technological methods of production are represented. This includes artifacts produced by means of reduction (e.g. groundstone) and accretion (e.g. fired clay objects). Because of this variation, the select portable material culture assemblage of Colha as a whole does not lend itself to the application of one particular framework, method, or model of analysis. An answer to this issue is found in an attribute based analysis.

It has been suggested that a path for revealing the social and cultural significances of material culture is found in the isolation of artifact variation, i.e. attributes (Chilton 1999b; Dietler and Herbich 1998). According to Webster (1996) an attribute is a quality, character, characteristic, or property attributed as belonging to a person, thing, group, etc. In this analysis an attribute is defined as any variable of an artifact such as length, width, weight, surface treatment, raw material, etc. Any given artifact may have several attributes. A combination of these variables at the artifact level as attribute patterning is used to develop clusters of artifact "types".

Technology, Techniques, and Technological Strategies

The identification of the production strategies and technology(ies) responsible for the production of artifacts provides another avenue for presenting data for an assemblage such as Colha's. Production technology as it is used here, is defined as a set of physical acts (techniques) that are responsible for the production of things. Hayden (1998:2) suggests a complementary definition, where "technology is that which is utilized to solve problems." Within the technological system are found techniques. Techniques as used in this analysis refer to the way(s) in which things are made (Dietler and Herbich 1998:235).

According to Ingold (1993a, 1993b) technology and techniques are part of an intertwined relationship that at the same time is separate. In Ingold's application, techniques represent the human choices that are responsible for the creation of materials and their style. Although fundamentally similar to the use of techniques as it is applied in this study, it differs in that its use is grounded in practice theory and in particular Bourdieu's (1977) concept of habitus (Dietler and Herbich 1998:245; Hegmon 1998). In this scenario techniques recognize the embodied skills of human agents (Ingold 1993:342).

The analytical application of this theory has predominantly been geared toward the identification of material culture patterning in the form of "style". In reviewing the archaeological literature many definitions and concepts of style as it is applied to material culture are found (see Conkey and Hastorf 1990; Dietler and Herbich 1998; Hegmon 1998; Lechtman 1977; Wobst 1977). Style has been attributed as being a method of communication, the variability that is culturally significant, characteristic patterns of material attributes in objects, residual attributes, and a way of doing things (Dietler and Herbich 1998: 236; Hegmon 1998; Lechtman 1977; Sackett 1982, 1990; Wobst 1977:321, 1999). This concept of "style" has largely been applied as an analytical tool to ceramic (e.g. Hegemon 1989, 1995; Hill 1985) and lithic assemblages (e.g. Sackett 1982) as a means of determining social identities and boundaries.

A framework for analyzing technological systems, founded in design theory (see Bleed 1986; Horsfall 1987), has been suggested by Hayden (1998). Hayden (1988) proposes two types of technological strategies, practical and prestige.

Practical technologies are the solutions to practical problems of survival and comfort. Although the purpose of prestige technologies is “to solve a social problem or accomplish a social task such as attracting productive mates and allies or bonding members of social groups together via displays of success” (Hayden 1988:11). A key factor in prestige technologies is the availability of surplus labor. Hayden (1988:33) does caution that prestige technologies are not static and they may eventually transform into practical technologies.

An underlying principle in both strategies is design theory and in particular design constraints (see also Bleed 1986). According to Hayden (1998:7) there are four major constraints that affect the application of practical technologies, 1) location (physical), 2) material, 3) technology, and 4) socioeconomic. While the major constraint of prestige technology is socioeconomic, however constraints of material, technology, and ideology also apply.

The select portable material culture assemblage of Colha is comprised of a variety of artifacts meeting the qualifications of practical (e.g. bone awls) and prestige (e.g. greenstone) technologies. The artifact forms and subforms as developed through an attribute analysis are examined according to these two technological strategies. It is hoped that through the application of Hayden’s framework information regarding artifact function including social function may be understood.

SITE FORMATION PROCESSES AND DEPOSITIONAL BEHAVIORS

The archaeological record as revealed by excavation is not brought forth unaltered; it was formed through a series of depositional and post-depositional processes. These processes can affect the archaeological record at both the unit and site level. Thus, also affected are the material culture remains, their context, and the spatial patterns they reveal. Therefore, to identify these processes is to gain an understanding of the sources of variability as they may be reflected in the contextual archaeological record.

Schiffer (1987:23) suggests that formation processes can be viewed within four dimensions: 1) formal, 2) spatial, 3) frequency, and 4) relational. By deductive reasoning the formation processes associated with each dimension may be identified and a line of evidence for behavioral inferences are revealed.

Cultural and non-cultural formational processes equally affect the archaeological record. The first process is deemed cultural because it owes its transformation to human behavior. Schiffer (1987:7) further defines this process as human behavior that affects or transforms artifacts after their initial period of use in a given activity. Environmental factors are responsible for non-cultural formation processes.

Cultural Formation and Deposition Processes

Cultural formation processes are responsible for moving artifacts from systemic context to archaeological context. Plainly put, cultural formation processes are the contribution of human societies to the archaeological record. The methods of this contribution can vary, but are generally considered to be processes of accretion. Not all types of cultural depositional processes can be discernable in the archaeological record.

The behavior and actions of site's inhabitants, at both the household and site level, are revealed in the cultural formation processes. Thus, the stage in the life history (occupation) of a site, as well as that of the households within it, can affect the type of cultural deposition that occurs archaeologically (see LaMotta and Schiffer 1999:20-21). Further variation can be attributed to post-depositional processes. Sources of cultural formation and depositional processes include reuse, discard, borrowing, ritual caching, burial, disturbance, abandonment and reclamation.

Reuse Processes

Through various processes of reuse an item can be maintained in systemic context. Thus reuse can and does affect the archaeological record as it is recovered. Three types of reuse processes can alter the prehistoric record 1) lateral cycling, 2) recycling, and 3) secondary use (Schiffer 1987:27-32).

Lateral cycling requires only a change in user. Recycling requires that an item no longer functioning in systemic context re-enter that context as raw material. Items are in secondary use when they take on a new use without the need of extensive modification or re-working (Schiffer 1987:30). However, it should also be noted that many artifacts might have been multi-functional, therefore defining an item's primary use may be difficult.

Lateral cycling can reflect trade within a community, between communities, or at the person to person level. However, this type of reuse is most likely invisible in the archaeological record. An example of recycling is viewed in the re-use of ceramic sherds at Colha. Sherds were reworked to create artifacts of varied function and form including pendants, perforated disks, and net weights. Secondary use is illustrated in the reuse of broken vessels such as those used for lining clay pits within households during the Middle and Late Preclassic periods. Inferring secondary use can be difficult when dealing with subtractive technologies such as lithics since depositional and post-depositional processes may result in damage that mimics that of use.

Discard

Probably the most common type of cultural deposition in prehistoric societies is discard. Discard is probably responsible for the majority of materials found archaeologically. The archaeological record reflects several types of discard processes that may be associated with patterned behavior. Intentional discard occurs normally at the end of the use-life of an artifact. Therefore, discard is the primary process mechanism for passing artifacts from systemic to archaeological context.

Schiffer (1987) has proposed several types of discard that may be reflected in the archaeological record. The discard behaviors that are most likely to be associated with prehistoric communities are primary, secondary, and provisional discard, maintenance processes, waste streams, and loss. Loss due to “child’s play” may also account for a limited amount of loss or discarded materials. However, its identification is difficult to distinguish.

Primary refuse refers to the location of discard in relation to the activity. Artifacts that were discarded at their location of use are considered to be primary refuse deposits. The lithic workshops at Colha provide a good example of primary refuse. Waste materials and rejects are found in locations that have been identified as work areas (see Hester 1979; Hester, Eaton, and Shafer 1980; Hester, Shafer, and Eaton 1982, 1994.). However, as soon as materials are removed from their primary locale they become secondary refuse.

Maintenance processes include the activities associated with cleaning an area of waste and debris. The resulting accumulation can be categorized as the beginning of the waste stream, which in turn becomes secondary refuse. It should be noted that at the household level the majority of items entering the waste stream were probably perishable. Therefore, primary and secondary discards of the waste stream may be invisible in the archaeological record. Although discard occurs during this maintenance process the identification of this behavior archaeologically is difficult.

Provisional discard represents those items that are no longer used, but are stored for possible later use. This may be a reflection of an artifact's function or state of completeness. After the end of their current use-life, items manufactured from greenstone "jade", a material highly valued by the Maya, were probably placed in provisional discard until they could be placed back into systemic context through recycling or secondary use. At Colha, artifacts manufactured from highly valued materials are not frequently recovered from midden or construction material deposits. When they do occur in deposits such as these, it is normally attributed to representing a ritual activity. However, broken greenstone beads are often recovered from cache and burial contexts.

Loss probably accounts for a small portion of the recovered material culture. How does one determine if an item was lost or misplaced and what affect does it have on the archaeological record? The probability of loss and possible retrieval has been expressed statistically by Fehon and Scholtz (1978:271).

Borrowing

Borrowing or temporary transplantation of artifacts may also affect the archaeological record without archaeologists even knowing so. An example of such a practice at the community level is viewed at the ancient Maya site of Cerén, located in El Salvador. Cerén was occupied until A.D. 590 (+-90) when an eruption of the volcano Loma Caldera caused immediate evacuation (McKee 1999: 32). The resulting three to seven meters of ash deposit has preserved the site, as it was the day of its abandonment. This snapshot of a moment in time has provided archaeologists the ability to view material culture of the Maya as it occurred in systemic context at Cerén. It should be noted that this one example does not reflect all material culture in use in the Maya area in either time or space.

Archaeologists noted that missing among the household artifact assemblages were manos and metates. Excavation of a community structure revealed the presence of multiple manos and metates positioned as if in use. The discovery of milpas with corn ready for harvest lead archaeologists to the conclusion that the harvest and processing of corn was a community effort and occurred in the community structure. The "borrowing" or movement of the manos and metates thereby affects the archaeological patterning of material culture as it occurred at the household level at Ceren.

Ritual Deposits

Ritual deposits in the form of caches are ubiquitous throughout Mesoamerica and are quite prevalent at Colha, especially in the Late Preclassic and Protoclassic. This behavioral practice leaves a unique mark on the archaeological record in that it reflects an intentional burying or placing of item(s) commemorating an event of the past. Caches are usually discrete deposits associated with ritual or ceremonial activities. Archaeologists often describe them as representing a dedication or termination of an event or physical entity such as a building. By labeling these deposits with specific behavior implication terms we are assuming to represent the thoughts of the person(s) or community responsible for the deposit. These labels only represent possible scenarios.

What are the differences between a dedication or termination caching event? According to Schiffer (1987:81) a dedication cache represents an object or set of objects that are deposited at the dedication of a construction site. A termination cache marks the termination of a building prior to construction a new construction event. There seems to be little or no differences between these two types of behavior other than the labels that are placed on them by archaeologists. How can one determine if a cache or any type of ritual deposit is associated with the dedication or termination of an event since both register the same signature? It is safe to say that these discreet deposits do represent past behavior associated with ritualistic activity. However, it would be quite difficult to determine the purpose or meaning behind that behavior without more specific data

Burial

People operate in a systemic context and are therefore part of that context. With internment they become part of the archaeological record. How the physical body is treated impacts the recovery of a data pertinent to studies of population, gender, and status. The receptacle, its location, and associated artifacts are all variables that provide clues to the treatment of the dead in past cultures.

In the context of a burial, the function or use of associated material culture or artifacts may be determined. When a burial is discovered with beads around the chest region is may be assumed that as a group, the beads functioned as a necklace. Thus reinforcing that it is through context that meaning was determined. The different occupation periods identified at Colha also reflect varying burial practices. This is seen in both the method and location of internment and the accompanying burial furniture. The temporal identification of these patterns on a site and multi household level provides a basis for regional comparisons and assumptions regarding the status structures.

Abandonment and Reclamation Processes

Just as cultural depositional processes affect the archaeological record so too do abandonment and reclamation processes. Most sites as they are revealed archaeologically reflect a series of abandonment and reclamation processes. This also holds true for areas within a site such as households. Therefore, the archaeological record at the site and habitation level should also reflect these processes. The interface between these two processes also provides much needed data regarding the chronological and cultural history of a site.

Abandonment Processes

Through abandonment a site and its residual artifacts, defacto refuse, revert to a state of archaeological context. Defacto refuse is the cultural by-product of abandonment (Schiffer 1987). The quantity and type of defacto refuse depends on a number of factors including rate of abandonment, season of abandonment, and distance to the next settlement (Schiffer 1987:91). The artifacts themselves are a factor in that their size, shape, and weight may not be conducive for transport depending on the type and method of abandonment. Some artifacts may have just been left behind accidentally. Another consideration would be the intrinsic value of an item and its function in the society be it technological or ideological.

Reclamation Processes

Because a site, household, or activity area falls into a state of abandonment does not mean that the defacto refuse remains in archaeological context. Reclamation processes can bring items/artifacts back into systemic context through a variety of means. Sites or households can be re-inhabited, scavengers may rummage for usable items, and ancient looters may loot. The Postclassic occupation of Colha, as presented in Chapter Three, details such an example. Excavations of burials at Colha have revealed the internment of secondary skeletal remains as part of the burial furniture. Other examples include the reuse of construction materials as seen during the Postclassic at Colha. Thus, reclamation processes affect the archaeological record of the previous occupation.

Disturbance Processes

Ancient and modern cultural disturbance practices can have a detrimental affect on the archaeological record. Disturbance is classified as any processes that affect items within archaeological context. Artifacts cannot be placed into systemic context through disturbance processes thus distinguishing it from processes of reclamation.

Major types of disturbance processes include trampling, use of land for agricultural purposes, movement of earth for construction, and manipulation of water sources such as redirecting streams. The actual impact on material cultural is dependent on the type and length of disturbance. At Colha, both modern day milpa and plow farming have effected the systemic context of archaeological material culture.

NON-CULTURAL ENVIRONMENTAL PROCESSES

Just as cultural formation processes influence the archaeological record so too do non-cultural processes. Environmental disturbances may occur during the depositional and/or post-depositional phase. Flooding, earthquakes, hurricanes, vegetation growth, and natural fire are just a few of the environmental processes that may alter the record as it occurred during deposition and post-deposition. The geographical position of site alone can greatly affect preservation thus influencing the material remains. Another factor is the chemical composition of the soil, i.e.

soluble salts and ph levels, which may drastically alter artifacts as they occur in the three dimensions described by Schiffer (1987).

In the Maya area, sites that are positioned within heavily forested areas often suffer much damage due to predominately above ground and near-ground tree root systems. When a tree falls, its entire root system may be uprooted bringing with it artifacts and architectural features. The resulting damage creates a mixed context as earlier materials may be placed on top of those dating to a later period.

CHAPTER 3

BIOPHYSICAL ENVIRONMENT: SETTING THE STAGE

The archaeological site of Colha is part of a greater cultural zone known as the Maya area. For centuries the ancient Maya occupied an area that is comprised of approximately 324,000 km^2, which was and remains topographically, geologically, and ecologically (environmentally), diverse. This bounded biophysical environment has been divided into geographically heterogeneous zones, the highlands and the lowlands. Within the setting of highlands and lowlands further sub-divisions are found (Table 3.1).

Table 3.1. Sub-divisions of the Highland and Lowlands

Highlands	Lowlands
Northern Volcanic Southern Metamorphic	Southern Transitional, Peten or Central, and Northern Yucatecan

Site specific studies such as this benefit from placing the site and the immediate surrounding area into an environmental context while also presenting a review of the overall Maya area. An understanding of the ancient environment of a site provides another avenue for viewing its cultural, social, and economic development and possibly its demise. This also applies to the material culture functioning within the site as it may reflect or represent possible reactions to environmental changes and or stresses.

In this vein, this chapter presents a review of the geographical sub-divisions of the highland and lowlands as presented in Table 3.1. It concludes with a focus on the biophysical environment of Colha and Cobweb Swamp. The majority of information presented for each area is derived from descriptions of the present biophysical environment and where possible, is supplemented with data gleaned from the prehistoric record.

Colha is a good example of a site whose occupants through manipulation of the landscape and harvesting of its natural resource (cherts) sustained and nourished a society and enabled the development of craft-specialization (Hester 1985b, 1982; Hester and Shafer 1984; Shafer 1982b, 1994a; Shafer and Hester 1983). The multi-faceted investigations into the biophysical environment of Colha have enabled a greater understanding of its role in the development, collapse, and eventual reoccupation of the site as presented in Chapter Four (Hester and Shafer 1994).

THE HIGHLANDS

The Maya highlands can be subdivided geologically into two separate sub-regions, the south and the north. In the archaeological literature, these two areas are commonly referred to as the southern metamorphic highlands and the northern volcanic highlands. Further divisions within each of these zones do exist, however, this discussion is limited to a general description of these two areas.

Southern Volcanic Highlands

The southern volcanic highlands are dominated by an almost continuous line of active volcanoes, which form the continental divide (Morley et al. 1983). It is bound to the south by the coastal plains of the Pacific coast, to the northwest by the Río Grijalva, and to the northeast by the Río Motagua. The latter includes a number of valleys with highly fertile alluvial soils.

The principal river system is the Río Motagua, which drains into the Gulf of Honduras and the Caribbean Sea through northward flowing tributaries. The vegetation ranges from mixed evergreen to deciduous forest. There also exist pockets of desert like conditions and vegetation at intermediate elevations along the Río Motagua. The mean annual temperature varies from 15 ^{o}C to 28 ^{o}C. Two seasons predominate, dry (January – May) and wet (June – December). Annual rainfall differs by region with variations between 1,000-3,000 mm per year.

Volcanic peaks surrounding the valley contain numerous outcrops of obsidian, which were quarried prehistorically for use in the production of utilitarian and non-utilitarian items. Obsidian from the mountains El Chayal and Ixtepeque is found throughout the Maya area and other regions of Mesoamerica.

Northern Metamorphic Highlands

The northern section of the highlands extends from the Río Motagua in the south to the Río Grijalva in the north. The southern portions of this region are characterized by metamorphic and igneous rock of Paleozoic age, while Cenozoic age limestone deposits dominate the north. Several distinct ranges are located within this region, including the Sierra de las Minas, Altos Cuchumatanes, the Sierra de Caucus and the Cordillera de Chiapas (Morley et al. 1983:31). Like its southern counterpart, this region contains a number of alluvium-filled valleys.

The principal river system for the northern highlands is the Río Usumacinta and its tributaries (Río Jatate, Río Chixoy, Río Pasión, and Río Plochic), which flow northwest into the Gulf of Mexico. Vegetation for this region includes Pine and Oak Forest stands in areas of higher elevations to tropical deciduous forest. Temperatures can range from below 15 ^{o}C in the higher altitudes, to a tropical 34^{o}C in areas to the west, north, and south (Morley et al. 1983:32). Average annual rainfall varies from 2,000 to more than 3,000 mm. The northern portion of this region tends to endure a longer and more intense wet season resulting in annual rainfall average of 3,000 mm or more.

This region possesses a raw material with a long history of value to the Precolumbian populations, greenstone. Although there are many known sources, many remain yet to be discovered (Lange 1993, Walters 1982). Greenstone varies in quality, texture, and color implying the existence of several sources. The greatest known source of greenstone is in the Sierra de las Minas, and artifacts manufactured from this source are found throughout the Maya area and all of

Mesoamerica (see Hammond et al. 1977; Hammond 1991b; Lange and Bishop 1988).

THE LOWLANDS

The lowlands, except for a southwestern portion, are situated upon a single limestone shelf, which formed during the Eocene and emerged during the Pleistocene (West 1964:70). This shelf referred to as the Yucatan Platform or Peninsula is a low-lying partially exposed platform composed of Mesozoic and Cenozoic carbonates and evaporates (West 1964). The solubility of its carbonate rock composition (limestone, marl, and gypsum) provides a suitable setting for the development of karstic terrain (Dunning 1992:13; West 1964:72).

The peninsula encompasses an area of approximately 222,000 square kilometers (Wilson 1980:6). The boundaries of the peninsula as defined by Wilson (1980:5-6) are as follows:

> "the peninsula is considered to extend northward from the southwestern corner of the Gulf of Honduras (Bahía de Amatique), its southern boundary following the Río Sarstún, then west and northwest to the Río Salinas (Chixoy), northwestward along the Salinas-Usumacinta Valley, along the east side of the Sierra del Lacadón to the Río San Pedro Martin, then northwestward to the Laguna de Términos west of Isla del Carmen to the Gulf of Mexico".

Within the peninsula lies a myriad of smaller habitats (Dunning and Beach 1998:88). In an attempt to illustrate this variation, Dunning and Beach (1994;

1998:91) building upon Wilson's (1980:7-9) physiographic zones, have developed 27 "adaptive regions" for the lowlands. (Table 3.2).

Table 3.2 Adaptive Regions

Adaptive Region	**Description**	**Adaptive Region**	**Description**
1	North Coast	**15**	Three Rivers
2	Caribbean Reef & Eastern Coastal Margin	**16**	**Río Hondo (the study area)**
3	Northwest Karst Plain	**17**	Lacandon Fold
4	Northeast Karst Plain	**18**	Petén Itza Fracture
5	Yalahau	**19**	Libertad Anticline
6	Cobá-Okop	**20**	Río de la Pasión
7	Puuc-Santa Elena	**21**	Dolores
8	Puuc-Bolonchén Hills	**22**	Belize River Valley
9	Central Hills	**23**	Vaca Plateau
10	Edzna-Silvituk Trough	**24**	Maya Mountains
11	Quintana Roo Depression	**25**	Hummingbird Karst
12	Uaymil	**26**	Karstic Piedmont
13	Río Candelaria- Río San Pedro	**27**	Motagua and Copan Valleys
14	Petén Karst Plateau		

Provided for each of the "adaptive regions" is information regarding the soils, topography, and water resources, which serves to illustrate the diversity of the lowlands. As in the case of the highlands, the lowlands have traditionally been subdivided into three distinct zones: 1) southern transitional lowlands, 2) the Peten, or central lowlands, and 3) northern Yucatecan lowlands (Morley et al.1983:34). Information is presented according to these subdivisions. More detail is provided for the Peten, central lowlands, as Colha lies within this zone.

The Southern, Transitional Lowlands

The southern lowlands are the transitional zone between the northern metamorphic highlands and the lowlands. This area includes the tropical rainforest of Chiapas, Huehuetenango, Quiché, Alta Verapaz, and Izabal (Adams 1991:123; Morley et al.1983:36). Also included are the low-lying coastal swamp margins of the Gulf Coast and Caribbean. It is bounded to the north by the Río Candelaria and to the south by Río Sarstoon. It includes all or portions of the following adaptive regions as noted in Table 3.2: 2, 13, 14, 17, 26, and 27. Geologically it is comprised of Mesozoic and Cenozoic limestone, karstic plateaus, except for a southeast area of metamorphic materials, which are a continuation of those found in the northern lowlands.

The principal river systems are the Río Usumacinta and its tributaries (Ríos Jatate, Lacantun, Chixoy, and Pasión) to the west and the Río Sarstoon and Río Dulce and their tributaries (Río Chamelecon and Río Ulua) to the east. The predominate vegetation is categorized as tropical rainforest. Patches of mangrove swamp occur in the lower-lying coastal regions. According to the Köppen system, this area is classified Af, Tropical Rainforest climate. Annual rainfall levels range from 2,000 to 3,000 mm. Average temperatures range between 25^{o} to 35^{o} C (Morley et al.1983).

The Peten, or Central Lowlands

The Peten or central lowland encompasses the areas of Guatemala's Department of Peten, the central eastern portion of the Yucatan peninsula in Mexico, and northern Belize. It is bound by to the east by the Caribbean sea and to the west by the Río Candelaria. It is characterized by low, generally east-west ridges of folded and faulted Cenozoic limestone (Morley et al. 1983:37). The adaptive regions (Table 3.2**)** for this area include portions of or all of the following: 2, 9, 10, 11, 12, 14, 15, 16, 18, 19, 22, 23, 24, and 25.

The major river systems to the northwest are the Río Candelaria and Río Mamantel, both of which drain into the Gulf of Mexico. To the northeast the Río Hondo, New River, and the Belize River flow northeast and discharge into the Caribbean Sea. Centrally positioned streams connect with the Río Pasión.

Tropical deciduous or semi-deciduous forest, lakes, and seasonal bajos dominate the landscape. Its Köppen system classification is AM, Tropical Monsoon. Average temperatures range from 25º to 30º C, however, it is not unusual for the daytime high to reach between 32º to 38º during the dry season. In general, the total rainfall averages 2,000 mm (80 inches), with the majority occurring during the rainy season, June through January. The months of February to May are characterized as dry periods in which less than 100 mm rainfall occurs. It should be noted that these are generalizations and that variation in temperature and rainfall occurs throughout this area for any given year.

The analysis of two sediment cores from Lake Quexil and Lake Sacnab in the Petén Lake District of Guatemala provides data regarding the prehistoric environment of a 50 km^2 area (Vaughan et al.1995; see also Brenner et al. 2002 and Leyden 2002). According to Vaughan et al.(1995) during the Pre-Maya period (Early Holocene), this area was dominated by tropical forest; by the early Preclassic (Mid Holocene) the landscape was on is way to becoming open savanna. Data suggest the open savanna expansion was human induced. The largest deposit of carbonized fragments (five times that of the later periods), an indicator of deforestation, occurs in the Late Preclassic levels for both cores (Vaughan et al.1995:82).

By the Early Classic open savanna environment prevails along side patches of "high forest", "dry forest", and "bajo forest" (Vaughan et al. 1995:82). Pollen evidence from the Maya area suggests deforestation during the Late Classic (Late Holocene) (Brenner et al. 2002; Leyden 2002). This deforestation is usually attributed to humans, however, recent evidence indicates climate drying may have also had an affect on forest reduction (Brenner et al. 2002:152; Gill and Keeting 2002). During the Postclassic (Late Holocene), reforestation is again evident in the pollen record (Brenner et al. 2002; Leyden 2002).

Natural outcropping of high quality chert occurs in this region at and around the archaeological site of Colha in Northern Belize (Hester and Shafer 1984). Stone tools, both utilitarian and non-utilitarian, produced from this source have been found throughout the Maya area (Hester and Shafer 1984. 1994; Meadows 2001).

The Maya Mountains of Belize served as another source of raw materials utilized by the prehistoric inhabitants of this zone. This “mountain” range is composed of Paleozoic rocks with an eroding outer covering of cretaceous and early tertiary sediments (Dixon 1956:7). The exposed formations provided prehistoric inhabitants with an easily accessible source for granite, quartzite, slate, schist, sandstone, greenstone (possibly), and limestone (Dixon 1956:8-9; Dunham 1996). Artifacts produced from all of these materials have been found in the Maya area and especially in Belize. In fact, some of these materials are still procured and utilized by the modern inhabitants of Belize as part of a cottage industry (personal observation).

Coastal sites in Belize have reported evidence of salt manufacturing during the Terminal Classic (Valdez and Mock 1991). These coastal sites may have also served as procurement areas for tropical tree cropping and marine resources (McKillop 1996). Many of the shell species that occur archaeologically may be found in this region.

The Yucatecan or Northern Lowlands

The Yucatecan or northern lowlands is situated on the northern half of the Yucatan peninsula. It is bounded to the west by the Gulf of Mexico and to the east by the

Caribbean Sea. Geologically it is defined by karstic plateaus. A series of low relief hills are seen in the northwest, the Bolonchén - Puuc Hills (adaptive region 8). As illustrated in Table 3.2**,** the following adaptive regions are found in this area: 1, 2, 3, 4, 5, 6, 7, 8, and 10. The North Coast, adaptive region 1, is known archaeologically as an area of salt production (Andrews 1983). It is also known as a procurement area for marine products including shell and protein.

The dominating karstic terrain manifests itself through a landscape riddled with chultunes, caves, and more specifically the "Ring of Cenotes" (Dunning and Beach 1998:88). Because of the general dryness and lack of surface water, the cenotes were and are still an important source of water (Dunning 1990).

The dominant vegetation is scrub-brush, however, forest stands including hard woods do occur in the northeast corner (Morley et al. 1983:42). According to the Köppen system this region is predominately classified as Aw, Tropical Savanna with a small strip along the northwest coast at BS, Semi-Arid. Rainfall averages vary according to region and for any given year. The northeast coastal zone ranges from 500 to 1,000 mm per year. The average rainfall in the southern border area is 1,500 mm. This average decreases as one moves north to 1,000 mm. The annual rainfall for the forest stands that occur in the northeast portion of this area averages 1,500 mm.

Two core samples taken from the Cenote San José Chulchacá in northwest Yucatan provide data regarding the prehistoric climate and environment of this area

(Leyden et al. 1996). Analysis of the core samples indicates that from 6150 B.C. until ca. 1800 B.C. (the Early Preclassic), this area was wetter than today and supported dry-moist transitional forests. Sometime during the Early Preclassic a drying trend began which resulted in open dry forests that are still present today. A brief episode of wetter conditions began during the Terminal Preclassic (ca. A.D. 250) and lasted until the Early Postclassic (ca. A.D. 1000) at which time the drying trend returned.

THE ARCHAEOLOGICAL SITE OF COLHA

The archaeological site of Colha and the adjacent Cobweb Swamp are located in Orange Walk, District of northern Belize and are part of the central northern lowlands. Colha lies approximately 20 km from the Caribbean Sea. The site is bisected by Rancho Creek, which drains east into the wetland area of Cobweb Swamp. According to the Köppen climate classification, the site falls within Tropical Monsoon (AM), which is characterized by wet/dry seasons (Wilson 1980:25). Rainfall averages collected from a station in Orange Walk District, indicate an average of 1,500 mm per year (Valdez, personal communication 2000).

Geologists have divided the country of Belize into four principal areas: 1) Lowland Plains, 2) Maya Mountains, 3) Limestone Hills between the mountains and the plains, and 4) The Cays (Dixon 1956:7; Ower 1928). Colha is situated within the lowland plains region and rests upon a gentle karstic plain, comprising part of the Yucatan Peninsula (Jacobs 1992:32; Wright et al. 1959). The limestone deposits of northern Belize have been identified as being Upper Cretaceous to Middle Eocene in age (Dixon 1956:23).

According to Dunning and Beach (1998:93), Colha is positioned within the Rio Hondo "16" adaptive region. This region is described as including "swampy flood-plains of the Rio Hondo, New River, and related streams and the low, broad ridges separating them" (Dunning and Beach 1998:93). Based upon an examination of surrounding vegetation and slope, Jacob (1992:33) has identified three physiographic zones for the Colha/Cobweb Swamp area: upland forest, swamp forest, and sawgrass marsh.

The geology of the Colha area played an important role in its development (Hester 1979; Hester et al.1980, 1982). The site is situated on and near natural surface and subsurface outcroppings of chert, which have been identified as occurring in at least three stratigraphic layers (Hester and Shafer 1984: Shafer 1991; Wright et al. 1959). Chert, a hard siliceous stone, forms as nodules in limestone and can be found throughout the Yucatan peninsula. At Colha, nodules measuring up to one meter across and nearly half as thick have been recovered (Tobey et al. 1994:268). In his trace element examination of materials from the Belize chert-bearing zone, Tobey (1994: 272-273) was able to distinguish two chert types that were utilized by the Colha inhabitants.

COBWEB SWAMP

Cobweb Swamp, a perennial wetland of variable water levels, is located directly adjacent to the archaeological site of Colha and encompasses 40 km^2 (Jacob 1192). The principal drainage system is Lopez creek that enters the swamp from the northeast and exits to the southeast, at which point it becomes Quashie Banner Creek. The latter then connects to the Northern River Lagoon from which it enters the Caribbean Sea.

Pedological, geochemical, and paleobiotic analysis of core samples have enabled an attempt at reconstructing the prehistoric environment and agricultural use of Colha and the surrounding area. Preserved pollen dating before 6000 B.C. has been found throughout Cobweb Swamp in a series of analyzed sediment samples (Jacob 1992:1). For the purpose of this study, discussion is limited to the periods of human occupation at Colha as reflected in the archaeological data.

Stratigraphy

Through excavations and soil analysis, Jacob (1992) has developed a general stratigraphic sequence for the three physiographic zones identified. The stratigraphic units of the Uplands zone are comprised of a basal unit and Cobweb Clay. Jacob (1992: 37) states that for the purposes of his study, the entire upland mantle was lumped into a single pedostratigraphic unit, Cobweb Clay. The Swamp Forest revealed three soil-stratigraphic units: Basal Clay, Cobweb Clay, and Maya

Clay capped by a thin organic veneer (Jacob 1992:39). Two carbon samples collected from the base of the Maya Clay suggest a deposition date ranging from 523 B.C to A.D. 645 (Jacob 1995:186). The radiocarbon dates associate the deposit of the Maya Clay no earlier than 523 B.C, Middle Preclassic and no later than A.D. 645, Late Classic. The soil-stratigraphic units of the Sawgrass Marsh are: Basal Clay, Lower Marl, Lower Peat Upper Marl, and Upper Peat respectively (Jacob 1992:62).

Human Modification of the Landscape and Agriculture

Evidence of human occupation and landscape modification by clearing at ca. 3500 B.C., is found in the pollen record in the form of Chenopodiaceae and Amaranthaceae (Cheno-Ams), disturbance vegetation, and particulate charcoal (Jacob 1992). The pollen record recovered from three core samples, no. 300 and no. 250 Sawgrass Marshes, and no. 4BB Swamp Forest, also provide signatures of clearing for ca. 2500 B.C. (Jones 1991; Jacob 175, 132-133).

The Appearance of Cultigens

The first appearance of cultigen pollen at Colha is that of maize (*Zea mays*) and a single manioc grain (*Manihot esculentum*). Both were recovered from deposits dating to ca. 2500 B.C. (Jones 1994: Jacob 1992). However, recent recalibrations suggest a much older date of 3500 B.C. for the maize pollen (Iceland 1997:86). The recalibrated date is consistent with that known for the first appearance of cultigens (*Zea mays* and *Manihot esculentum*) at Cob Swamp, 3400 B.C. years (Pohl et al. 1996:362). Morphologically, the maize pollen recovered from Cob Swamp and Cobweb swamp are similar (Pohl et al. 1996:362). However, it should be noted that maize pollen recovered from early Middle Preclassic context is quite different from the early Preceramic specimens (Pohl et al. 1996:362). At the moment, the data does not allow for the conclusion that the manioc grains represent a domesticated species.

The appearance of Cheno-Ams in addition to cultigens suggest landscape modification and possible horticulture were occurring at Colha/Cobweb Swamp during the early Preceramic period (3400 – 1900 B.C.). The archaeological record at Colha during the early Preceramic indicates a period, the first in a series, of intensified lithic production (Iceland 1997:81).

However, the pollen record does not support horticultural intensification until ca.1500-900 B.C. corresponding to the Late Preceramic occupation of the site. Similar pollen records indicating clearing at or near this period have been identified for the Maya area at Lake Quexil (Vaughan et al. 1985:81); Laguna Tamarindito; (Dunning et al. 1998:145); Laguna de Cocos (Hansen 1990:158); and Cob and Douglas Swamps (Pohl et al. 1996:362).

Impact of Water Management

Evidence of canals/channels and associated field systems were also identified at Cobweb Swamp (Jacob 1995,1992; King 1993). The canals/channels measure three to four meters wide and the fields measure approximately three to five meters wide and 12 to17 meters long (Jacob 1995:156,179). Evidence for their use as agricultural and water management features are provided below.

Canals/Channels

Radiocarbon dates suggests the use of canals/channels from as early as 523 B.C. and as late as A.D. 645. At operation 1, Suboperation 2-N, a trench placed through a canal/channel situated between two fields revealed an abrupt termination of the 2Agb horizon at the canal edge and a sharp, irregular upper boundary of the 2Bgb horizon (Jacob 1992:51-52: Jacob 1995:180, 185). In addition, floating Cobweb Clay clasts were recovered from the Maya Clay. Jacob (1995:185-186) through a process of elimination was able to determine that the stratigraphy was indicative of human manipulation of a pre-existing canal/channel (Jacob 1992:157).

Pollen analysis of a core sample, no.9, taken from this unit reveals the appearance of Cheno-Ams and composites. The Cheno-Ams increase at one meter below surface until immediately above the Cobweb Clay where no pollen was detected (Jacobs 1992:104). In general, the Cobweb Clay is devoid of pollen (Jacob 1992; 1995).

Jacob (1995:185) concluded that the canal/channel probably represents human modification of preexisting natural features. During the Late Preclassic a documented rise in sea level (High 1975) manifests itself inland through a rise in the water table. This change resulted in flooding and expansion of the wetland areas such as those at Cobweb Swamp. The evidence presented suggests that these features were probably created and maintained as possible means of drainage/water management.

Wetland Fields

Operation 1,Unit 4BB, the Swamp Forest, yielded evidence of early human landscape modification in the form of two buried fields associated with the Cobweb Clay deposit (Jacobs 1992:163). Jacob (1992:159-162) suggests that the Cobweb clay fill or as it is referred to, "reworked Cobweb Clay", represents basal clay, transported during possible ditching or elevation episodes of adjacent areas.

Jacob (1992:158) reports that most modification appears to have occurred on the surface of the Cobweb Clay, preceding the deposition of the Maya Clay. Evidence of canal mucking or dredging by later inhabitants in efforts to maintain these fields is seen through floating clay clasts in the 2Agb and 3Agb horizons (Jacob 1992:160). It also suggests that dredging episodes may have occurred after the deposition of the Maya Clay

The lower field (3Agb) has been dated to ca. 3500-1000 B.C. by two associated carbon samples. The carbon dates place the development of this featured during the early Middle Preceramic occupation of the site (Iceland 1997). A soil humate date from the upper field reworked Cobweb Clay (2Agb) provides a date of ca. 1003 B.C. (Jones 1994; Jacob 1995:186). Palynological analyses of the upper field zone samples indicate a variety as well as an abundance of cultigens including maize (*Zea mays*), possible chili pepper (*Capsicum sp.*) and cotton (*Bossypium sp.*) (Jacob 1992:162; Jones 1994:207).

The implication is that the upper field is associated with the Middle Preclassic occupants (Bolay and Chiwa ceramic complexes) and occurred between 900-500 B.C. (Jacob 1995:186; Valdez 1994: 9-11). The Middle Preclassic faunal assemblage supports the use of wetland species that would be associated with an environment such as Cobweb Swamp (Shaw 1991:251).

Summary of Findings at Cobweb Swamp

Pollen, soil, and radiocarbon data suggest clearing and possible cultigens at Colha as early as 3500 B.C. Intensive human modification of the Cobweb Clay for agricultural purposes begins during the Middle Preclassic and continued into the Late Preclassic. The evidence indicates that the Middle Preclassic occupants were responsible for the initial manipulation of this stratum for water management purposes.

The Late Preclassic is a period corresponding to intensive occupation at Colha. Due to forest clearing and cultivation of the uplands, soil erosion began to deposit the "Maya Clay" onto the field and canal/channel systems (Jacob 1992:39). Radiocarbon dates place the deposition of this stratum from 523 B.C. to A.D. 645.

Pollen analysis finds that by A.D. 900, the Terminal Classic, there is a reduction in disturbance taxa (Jacob 1992:70). This date corresponds to the termination of occupation at the site as suggested by the ceramic and artifact assemblages (Valdez 1987; 1994: 14). The site is again re-occupied during the early Post Classic, ca A.D. 1000. The environment in and around the site probably witnessed some reforestation as indicated in the faunal assemblage (Shaw and Mangan 1994). Valdez (1994a:14) states that the ceramics for this period suggest a complete cultural change. He attributes the transformation to a possible change in the "resource orientation, i.e., the procurement and preparation of different food" (Valdez 1994a:15). The partially healed environment and landscape in addition to the source of high quality chert probably made Colha an ideal local for Post Classic occupation.

CHAPTER 4

CULTURE HISTORY OF COLHA, BELIZE

This chapter takes the traditional approach of presenting a site-specific culture history. In doing so, it provides a chronological overview of Colha's cultural history as gleaned from the archaeological record. The purpose of this chapter is to establish a cultural context from which the results of the portable material culture analysis may be presented and discussed. On a broader level, it provides a point of reference for linking patterns revealed in this analysis with those represented in the culture history.

Presented for each occupational phase, as established by the ceramic chronology, is a general overview of the material culture and settlement patterns that define it. Discussion of the portable material culture will be limited to describing the general trends, as they are the focus of this study. The ceramic and lithic sub assemblages will be presented in greater detail since they serve as diagnostic markers of the various phases of occupation.

THE CULTURE HISTORY OF COLHA, BELIZE

Archaeological evidence from Colha allows the interpretation of occupation from the Early Preceramic (3400 - 1900 B.C.) to Middle Postclassic (A.D.1150 – 1300) with population peaks occurring in the Late Preclassic (400 B.C. – A.D.100) and again in the Late Classic (A.D. 600 – 850) (Eaton 1980a; Iceland 1997; Valdez 1987, 1994a:10). Late Postclassic data is evident only through Mayapan-style censers associated with ritual visitation activities and arrow points (Hester 1982; Valdez 1994a:15).

The chronological periods of occupation are based upon Colha's ceramic complexes as identified by Adams and Valdez (1979a, 1979b, 1980a, 1980b; Valdez 1987, 1994a). A total of 10 complexes have been defined, nine that are functionally complete (Valdez, 1994a: 9). The Preceramic, although an important phase in the prehistoric history of the site will not be presented, as it is not in the cultural scope of this study. For a detailed discussion of this period as it is identified in the Colha archaeological record, the reader is referred to Hester et al (1993) Iceland (1997), Lohse (1993), and Wood (1990).

PRECLASSIC (900 B.C – A.D. 250)

The Preclassic at Colha is represented by three phases, Middle Preclassic, 900 – 400 B.C., Late Preclassic, 400 B.C. – A.D. 100, and Protoclassic, AD 100 – 250. The Middle Preclassic is comprised of early and late ceramic complexes, Bolay and Chiwa respectively. Within the Chiwa complex further refinements of early and late facets have been posited.

In general, the Preclassic can be characterized as a period of establishment and growth. This period also exhibits signs of developing social, economic, and cultural complexity. The majority of Preclassic data at Colha is reported from the 2,000 sector and portions of the 4,000 sector.

Middle Preclassic (900 – 400 B.C.)

The first evidence of settled Maya occupation at Colha dates to the early Middle Preclassic (900 – 600 B.C.). At this time, the site was probably composed of a series of interactive small dispersed households (Potter et al. n.d.). Evidence from Cobweb swamp and the faunal assemblage indicate that the early Middle Preclassic inhabitants utilized wetland agriculture and "garden hunting" as their means of subsistence (Jacob 1992; Shaw 1991a).

By the late Middle Preclassic (600 – 400 B.C.), Chiwa complex (or Mamom phase) settlement patterns suggest that the series of interactive households became unified and probably represented a low-level chiefdom society. In general, the late Middle Preclassic builds and expands upon patterns established in the early Middle Preclassic. It has been suggested that this late Middle Preclassic community is diversified and exhibits patterns of spatially segregated activities and areas (King 2000:100; Hester and Shafer 1994a).

Items acquired through system(s) of trade first appear during the early Middle Preclassic and continue into the late Middle Preclassic. By the late Middle Preclassic, there is an increase in the quantity and a greater diversity of raw materials and forms. Shafter (1994a) suggests that at Colha these items were acquired through a reciprocal system of exchange. Examples of non-local items, which survive archaeologically, include greenstone, obsidian, shell, igneous and metamorphic rock. Much of the high-value items such as greenstone were probably acquired by ruling lineages or clans as a means of legitimizing and reinforcing their status (Adams 1991:135). Obsidian, a trade item with the capability of providing trade data revealed that for the Middle Preclassic obsidian assemblage at Colha the San Martín Jilotepeque source dominated followed by El Chayal and a trace of Ixtepeque (Brown, Dreiss, and Hughes n.d.).

Evidence of a "perishable" and likely trade item, cacao, has recently been reported for Colha. Residue analysis from three spouted vessels associated with three late Middle Preclassic burials from the stepped pyramid at Op 2012 contained the chemical signature of cacao (Powis et al. 2002).

Two ceramic complexes represent the Middle Preclassic at Colha. The earliest ceramic complex, Bolay (900 – 600 B.C), corresponds to the early Middle Preclassic and has been placed in the Swasey Sphere (Valdez 1987). The dominant ceramic groups are the red monochromes Consejo Red and Ramgoat Red. Valdez (1994a: 9) states that the vessel forms for this period include "tecomates", re-curving side dishes or bowls, slightly flaring-sided vessels with flat bases, and bottles."

The late Middle Preclassic Mamom sphere, Chiwa complex (600 – 400 B.C.), is dominated by the (waxy ware) Joventude group (Valdez 1987).   Forms include strap handled spouted vessels or “chocolate pots” and “effigy bottles.” The Mamom ceramic signature of the double-line break consisting of pre-slip grooved horizontal lines is also present (Adams and Valdez 1980a).

Hester and Shafer (1994a: 26) suggest that lithic production during the Middle Preclassic was carried out as a cottage level industry. Using the Middle Preclassic lithic sequence established by Hester (1982, 1985b: 44, 46), Potter (1991a) examined the Bolay phase lithics from Operation 2012 and suggested three technological sub assemblages for this period, blades, bifaces, and trimmed flakes/unifaces. Within the blade subassemblage are found unmodified and modified macroblades, small blade forms, blade cores, burins, and burin spalls. Specimens, which fall under the biface subassemblage, include oval bifaces, two adze forms (t-shape and wedge shaped), and celts. Hester (1982) believes that the Middle Preclassic t-shaped adze is the precursor to the Late Preclassic tranchet bit tool. The final category of trimmed flakes/unifaces is less formal and is generally considered to be expedient in form.

It has been suggested that one of the functions of the Middle Preclassic burin spall was that of shell bead perforator or drill (Potter 1991a:24). To date, 1,149 disk shell beads have been recovered from Middle Preclassic contexts at Colha (Buttles 1992a). Beads of similar form and context are also noted throughout the lowlands and in particular in the northern Belize area for this time period (Aizpurúa and McAnany 1999; Hammond 1991). Limited shell bead manufacturing debitage has been recovered at Colha however, burin spalls in direct association with shell beads in varying stages of manufacture have been noted (Potter 1980:181, 1991a: 24).

The majority of Middle Preclassic settlement data has been recovered from Operations 2001, 2006, 2012, 2025, 2035, 2031, and 4046 (Day and Laurens 1982; Eaton 1982; Iceland 1997; Potter 1981; Roemer 1979). The 2000 sector, where all early Maya occupation seems to have focused, would eventually be transformed (during the Protoclassic), into the monumental center. This permanent early occupation is represented by semi-circular stone alignments with outer terrace alignments, which were erected directly upon the ground surface (Anthony 1987, Anthony and Black 1994; Sullivan 1991a).

Other early Middle Preclassic features include interior ceramic lined fire-pits, primary middens, burials, and caches (Anthony 1987, Anthony and Black 1994; Sullivan 1991a). Remodeling and multiple flooring episodes indicate a continued occupation for the duration of the early Middle Preclassic.

By the late Middle Preclassic Chiwa phase, the number of domestic residences and associated construction episodes encountered during excavation increases (Anthony and Black 1994; Sullivan 1991a). In general, settlement continues and expands in the areas first occupied during the Bolay phase with the later constructions almost obliterating evidence of the earlier Bolay structures.

Domestic residences for this period are represented by circular or apsidal shaped low walled structures that would have supported perishable superstructures. These structures were erected upon earthen and midden filled platforms. By the Chiwa phase structure configuration begins to represent informal groups (Anthony 1989; Anthony and Black 1994; Sullivan 1991a). Multiple construction phases, additions (patios), and modifications (floorings) are also noted for this period (Anthony 1987; Sullivan 1991a:20).

Associated with the Chiwa phase structures are midden deposits, interior ceramic line hearths, interior slab-lined hearths, burials, and caches (Anthony 1987; Sullivan 1991a). The associated lithic tool forms and ceramics are generally utilitarian thereby reinforcing a domestic function (Valdez 1987).

The Chiwa complex brings with it evidence of spatially segregated activities areas. Excavations at Operations 2006 and 2012 have revealed a possible specialized activity area and a formal cemetery complex. Outside the core area at Operation 2006, evidence of a possible undefined specialized activity area was revealed through the recovery of large hearths, plaster floors, and an overwhelming percentage of *tecomates* (Roemer 1979; King and Potter 1994:71).

During the Chiwa phase, large open platforms were erected at Operation 2012, at the southwest area of the central monumental. Prior to the erection of the platforms, the 2012 area had supported domestic residences similar to those located at Operation 2031 (King and Potter 1994:71). The importance of this locale as a place for public ritual activity was probably established during the Chiwa period. Shafer (personal communication in King 2000:100), suggests that this area represents and elite residential area or a quasi-elite cemetery.

Ritual activity may be best revealed through the behavior of caching. The Bolay phase marks the first occurrence of a cache deposit. It also marks the first use of a containment unit in the form of a ceramic vessel. Additional caches occur during the Middle Preclassic, but with no detectible containment unit (see Potter 1981).

Extended supine, semi-flexed, and tightly flexed burials dating to the early Middle Preclassic Bolay phase are reported from domestic contexts. During this period, burials are relatively standard in placement. Another standardization is seen in the burial furniture. Burial contents include ceramic vessels, normally placed over the head, and shell beads at the wrists and ankles. Other non-standardized furniture include an effigy ceramic vessel and one greenstone celt. Burials from the late Middle Preclassic Chiwa phase are primarily extended and supine. Location is more diversified and includes domestic internments and the use of a burial platform. Burial furniture remains standardized with the continued tradition of placing vessels over the face and shell beads at the wrist and ankles. The major differences are seen in the quantity of burial furniture as the late Middle Preclassic burials contain larger numbers of associated artifacts.

Late Preclassic (400 B.C. – A.D. 100)

The Late Preclassic is a period marked by an increase in population as well as cultural, social, ideological, economic, and settlement complexity at Colha (Hester and Shafer 1994a). Eaton (1982a:12) estimates site size for the Late Preclassic at 1 km^2 and population at about 600. The ability to support a growing community and workforce enabled Colha to engage in craft-specialization and erect public monumental architecture. This is manifested archaeologically in the discovery of multiple lithic workshops, the appearance of temple structures with platforms, a ballcourt, and formal plazas. The capability to execute and support these efforts suggests the emergence of social stratification probably in the form of a ruling elite class. Adams (1982: 61) suggests that during the Late Preclassic and Protoclassic, Colha and its elite class were probably independent to semi-independent.

The agroecological and pollen record at Cobweb swamp also supports a Late Preclassic population expansion. Direct evidence of site expansion and deforestation is found in the continued deposition of a “Maya Clay” and the appearance of Cheno Ams in the pollen record (Jacob 1992; Jones 1991). At Cobweb swamp, a series of wetland fields with a supporting system of drainage channels/canals were being utilized for agricultural purposes (Jacob 1992). This intensified agricultural practice along with garden crops and hunting helped sustain the growing population at Colha (Shaw 1991a). The pattern of forest clearing and agricultural intensification seen at Colha is also found in other areas of the Maya lowlands for this period (Adams 1980).

By the end of the Late Preclassic, Colha had developed into a center of economic importance based on intensified lithic craft-specialization (Hester and Shafer 1994a; Potter et al n.d.; Shafer and Hester 1983). Spatial segregation of activities is quite apparent throughout the site in both the household/domestic and public arenas (King 2000:101).

Material culture recovered archaeologically reflects a greater variety of raw materials and forms. This includes items acquired and produced locally as well as (raw) materials acquired through systems of exchange, reciprocation and/or redistribution. In the case of obsidian acquisition, trace element analysis indicates the dominant source for this period as Ixtepeque (Brown et al. n.d.). The assemblage also includes specimens derived from the sources of El Chayal and San Martín Jilotepeque. The expanding trade relations are probably linked to the organization and control of lithic production and a growing elite population (Shafer and Hester 1983). King (2000:159) indicates that the organization and control of lithic production seems to be more "managed" during the Late Preclassic. If so, this further supports the interpretation of greater involvement of the ruling elite class.

The Late Preclassic also sees the introduction of non-utilitarian lithics in the form of stemmed macroblades and bifacial symbolic flaked stones, formerly referred to as eccentrics (Meadows 2001). According to Meadows (2001) these symbolic flaked stones probably held ritualistic and/or ideological significance. Shafer and Hester (1983) directly attribute the control and distribution of the stemmed macroblades to a growing elite structure.

The Late Preclassic Onecimo complex belongs in and is representative of the Chicanel sphere at Colha (Valdez 1987:114). The dominant group is the Paso Caballo Waxy ware Sierra Red (Valdez 1987; 1994a). Vessels range from out curving sided bowls and dishes, and strap handled spouted jars to a variety of effigy forms.

During the Late Preclassic period at least 36 lithic manufacturing workshops were clustered within the central core area of the site (Hester and Shafer 1994a; Shafer 1994a:26). These workshops were responsible for the production of an estimated 4,500,000 tools (Shafer 1994a:26; Shafer and Hester 1983, 1986).

The formal tools produced in these workshops include oval bifaces, tranchet-bit tools or adzes, stemmed and unstemmed macroblades, and narrow lenticular bifaces. On a much smaller scale, flake stone symbols were also being produced (Meadows 2001). At Colha during the Late Preclassic, these symbolic flake symbols are most often recovered from cache deposits (Eaton, Hester, and Valdez 1994). Although they do occur in deposits at Colha, the majority of these items were most likely exported (Hester and Shafer 1994a; Eaton et al.1994).

Outside of Colha, these items are most commonly associated with cache and burial deposits (Eaton et al. 1994; Meadows 2001).

The proximity of the Preclassic workshops to areas of ceremonial activity suggest that during this period, lithic specialists probably maintained positions of high respect (Hester and Shafer 1994a; Potter 1994; Valdez 1994b). The discovery of the Operation 2012, Strat 55 cache provides another avenue of support for the strong ties between lithic specialists and ritual activity.

At the end of the late Middle Preclassic and the beginning of the early Late Preclassic a plaza floor was laid down covering much of the Middle Preclassic informal groups that existed in the main plaza at Operation 2031 (Anthony 1987; Sullivan 1991a). This re-orientation probably reflects a re-organization of the community. Domestic structures noted throughout the site were being erected upon plastered cobble, midden, and earthen-filled platforms and continued to be circular to apsidal in form (Anthony and Black 1994; Sullivan 1991a; Potter 1982). The most evident changes in domestic or residential architecture are a general increase in the size and elevation of house platforms. The structures themselves are comprised of low walls supporting pole and thatch superstructures. The recovery of daub fragments suggests wattle and daub construction techniques were in use (Sullivan 1991a).

Associated with the domestic architecture are hearths, middens, and burials. By the Late Preclassic, hearth features begin appearing on the exterior of structures.

Ceramic and lithic materials recovered from construction fill and midden context support utilitarian activities in these areas. The material culture assemblage recovered from domestic contexts includes raw materials that had to been acquired through a system(s) of exchange/trade such as greenstone and marine shell.

The Late Preclassic marks the introduction of monumental architecture at the main plaza and surrounding area (Potter 1981, 1982; Eaton 1981). This is manifested by a stepped pyramid and temple platform at Operation 2012, an elite residence at Operation 2025, and a ballcourt at Operation 2009 (Eaton and Kunstler 1980; Eaton 1980a, 1980b, 1982a; Potter 1982). By the Late Preclassic no evidence exists for domestic or residential use of the Operation 2012 ceremonial structure, thereby, solidifying it as an area of importance and a place of ritual activity. The reason(s) for this shift in spatial function has yet to be determined.

In addition to the ceremonial structure, evidence of ideological and ritual practices for this period is found in the construction of a ballcourt, the deposition of numerous caches, and burial complexes. Public ritual activity becomes intensified and is best revealed in the recovery of several cache deposits. The Late Preclassic also marks the trend of utilizing two lip-to-lip ceramic vessels as containment units. Cache contents and contexts also appear to be more diverse. Often contained within these caches are trade items including greenstone and marine shell (Buttles 1992a).

Of interest is also the appearance of non-contained caches of flaked stone symbols (Meadows 2001). These are comprised of stemmed macroblades and bifacial forms. The bifacial forms have been suggested to function as staff ends (Meadows 2001: 281). Meadows (2001) also suggests that both the stemmed macroblade and bifacial forms may have served as living symbols of power. The control of their production and final consumption by an elite network as suggested by Shafer and Hester (1983) serves to reinforce and strengthen such a network.

Late Preclassic burials become more complex in their method of internment. Locations for internment are found in both domestic and public settings. Burial furniture also becomes more diverse and includes a greater variety of raw materials and forms. Like the cache contents, burials have also started to contain greater numbers of trade items such as greenstone and marine shell. Differences in burial furniture and internment methods have enabled inferences regarding status (Buttles 1992a).

Protoclassic (A.D. 100 – 250)

The Blossom Bank complex has been refined and suggested to include a Protoclassic occupation (Valdez 1994a; Meskill 1992). This complex has been interchangeably referred to as the Terminal Preclassic. Recently, it has been proposed that the term “Protoclassic” should only be used to represent a ceramic stage (Brady et al. 1998). For this study, the term Protoclassic will be used to denote this time period as well as the ceramic stage.

At Colha, distinct changes and patterns in the material culture (flaked stone symbols, ceramics, architecture, burials, and caches) suggest that this period represents more than a ceramic stage and the termination of the Preclassic (Meskill 1992). Whatever term used, clearly Colha was demonstrating the precursors of Classic Maya society.

As was the case for the Late Preclassic, the material culture at Colha reflects a variety of raw materials and forms. The variation of raw material supports the premise of a growing system of trade and/or exchange, probably under the control of elite level personages. Raw material diversification at Colha is best seen in obsidian, greenstone, and shell artifacts. Obsidian trace element analysis indicates a growing reliance on the El Chayal source however, materials derived from San Martín Jilotepeque and Ixtepeque continue to appear (Brown et al. n.d.)

The Colha Blossom Bank complex shares similarities with the Floral Park subcomplex as established by Gifford (1976) in his analysis of the Barton Ramie ceramics. Other sites in this region have also identified Terminal Preclassic occupation (Cerros, Cuello), but only few have identified the attributes associated with the Protoclassic.

The dominant ceramic group for this complex is Sierra Red, with several other groups represented including San Felipe, Chactoc, and Sarteneja. The dominant ceramic type is a red ware that Valdez (1994a: 12) equates with Cerros' Chunux Hard Ware (Robertson-Freidel 1980). The distinguishing attribute is a "technological hardening of the vessel slip and a more glossy appearance" (Valdez 1994a:12). Valdez further states "both of these attributes lead into the Classic period glossy wares" (Valdez, ibid). Other distinguishing traits are dichrome resists and an elaboration of decoration such as trickle, positive painting, and through-the-slip incising. The Onecimo Sierra Red group also continues with the addition of some of the technology and techniques described above.

The lithic assemblage for this period is identical to that of the Late Preclassic. Evidence suggests continuous use of the lithic manufacturing workshops. The majority of bifacially flaked stone symbols tend to occur in deposits dating to the Protoclassic (Meadows 2001).

In the main plaza, at Operation 2031, a paving episode marks the transition from private/domestic to a public/ritualistic function (Anthony 1987; Anthony and Black 1994; Sullivan 1991a). Associated with this paving episode was a possible intentional termination of a Late Preclassic structure (Sullivan 1991a:34-35). Excavations at Operation 2031 have revealed two Protoclassic ancillary structures (Anthony 1987). Both have been described at being square to rectangular in form, which is quite a divergence from the apsidal to round form that dominated the Preclassic. Anthony (1987) suggests a non-domestic function for both. She has interpreted one structure as a storeroom and the other as a shrine/temple.

Ritual activity and a complex ideological system are reflected in the behavior of caching and burial throughout the site. The dominant caching behavior is the continued use of lip-to-lip ceramic vessels as containment units for a variety of raw materials and forms. The majority of Protoclassic caches are reported from Operations 2031 and 2012. The number of caches recovered at 2012 serves to reinforce the ritual importance of this structure during the Preclassic/Protoclassic. Of particular importance is the complex blood letting cache, Strat 55 (Potter 1994).

The vast number of ceramic containment and flaked stone symbol caches suggest that this was a period of intensified ritual activity at Colha. The reason behind this intensification has yet to be understood. What is known is that immediately following this period, Colha witnessed a period of low production, the Early Classic. Distinct changes in settlement, organization, and control of lithic production, as well as ritual activity preceded the Early Classic.

The main plaza (Op 2031) was another area to witness intensified ritualistic activities. This is reflected in a mass-burial complex, which includes a burial crypt or ossuary, and an elaborate burial of a female interred with extensive furniture and redeposited human skulls (Buttles 1992a; Foster 1997; Wright n.d.a). In general, burial patterns are more complex in terms of location, positioning, and furniture during the Protoclassic.

Another marker of this period is the development of a writing and mathematical system (Adams 1991). An early example of this writing system is found at Colha in the form of post-fired incised glyphs in the interior base of two Protoclassic Laguna Verde Incised cache vessels (Valdez 1987:130-131). The site of Kichpanha, located near Colha, also produced a Protoclassic example in the form of a bone incised with glyphs (Gibson et al. 1986). Other examples of early writing are found at only a handful of sites in the lowlands including Río Azul (Adams 1999; Valdez et al. 2001) and Nakbe (Hanson 2001).

CLASSIC (A.D. 250 – 875)

The Classic period at Colha is represented by three occupational phases and ceramic complexes, the Early Classic Cobweb complex, (A.D. 250 – 600), the Late Classic Bomba complex, (A.D. 600 – 700), and the Terminal Classic Masson complex, (A.D. 700 – 875). Faceting of the ceramic complexes are found within the Bomba and Masson segments.

The Classic period represents a time in which Colha attained its second fluorescence and its demise. During the Early Classic Cobweb complex are apparent decreases in population, lithic production, settlement patterns, mortuary practices, and in general, material culture. By the Late Classic (A.D. 600 – 700) Bomba complex, Colha witnessed a resurgence in population, lithic production, construction episodes, and ritual activity. In some cases, this florescence surpasses that which occurred during the Late Preclassic. The Terminal Classic (A.D. 700 – 875) Masson complex brought with it a cessation in new construction, intentional construction destruction, and a termination of occupation (Hester 1985a; Valdez 1994a:14).

Early Classic (A.D. 250 – 600)

The Early Classic is one of the least understood periods of occupation at Colha. There is little evidence of construction and no lithic workshops have been identified for this period. At Operation 2012, the stepped pyramid with temple platform, ritual and construction activities dating to the Early Classic have been positively identified (Potter 1982). Potter (1982:104) attributes a stairway, a floor, and three associated features to the Early Classic. Two of the features consisted of limestone capped circular cache pits containing basal flange bowls inverted over large orange jars. Each jar contained the remains of an immature individual, possibly human. No other artifacts were recovered.

Early Classic ceramics do occur throughout the site (cf. Eaton 1994:104) however, their numbers represent the smallest complex at Colha (Valdez 1994a:13). In general, Valdez (1994a:13) states that the Cobweb complex is not strongly represented. However, Valdez (2001, personal communication), suggests that some of the Late Preclassic and Protoclassic material culture including the ceramics may actually continue in style and form into the Early Classic.

The dominant Cobweb ceramic group is Minanha, other groups include Aguila, Pucte Brown, Dos Arroyos, Balanza, and Hewlett Bank. According to

Valdez (1994a) signifiers of a connection with central Peten and Barton Ramie are found in the Balanza and Aguila groups. Slight changes in surface treatment and rim form are also noted for this period. Valdez (1994a:13) suggests that in many respects, the slipped and to some degree unslipped types are a continuation of Late Preclassic and Protoclassic ceramic traditions.

There have been no lithic workshops at Colha identified as belonging to the Early Classic. As in the case of the ceramics, it is possible that the production of Late Preclassic/Protoclassic forms may have continued unchanged in style and form. However, it should be noted that during this period intensification of lithic manufacturing does occur at the site of Altun Ha (Meadows 2001).

Late Classic (A.D. 600 – 700)

The site of Colha experienced a resurgence in population during the Late Classic. Population is estimated to be about 1,000 persons residing within the 1 km^2 central site core area and 4,000 persons within a 6 km^2 radius (Eaton 1982). New construction of both domestic and public architecture occurred throughout the site and much of the site as it appears today is attributed to this period.

Ritual activity is again reflected through the behavior of caching (Eaton 1994; Eaton and Kunstler 1980:124). However, it should be noted that the number of caches and their contents dramatically decreases in comparison with the Late Preclassic and Protoclassic periods. Construction at both the ballcourt and the ceremonial structure (of Operation 2012), suggest their continued use as places of ritual activity (Eaton and Kunstler 1980; Potter 1982).

Lithic production on a large scale was again occurring during the Late Classic at Colha. The number of Late Classic and Terminal Classic workshops reported exceeds those of the Preclassic (Hester and Shafer 1994a). There are several major differences between the Preclassic and Late Classic workshops. In terms of location, Late Classic workshops are scattered throughout the site while Late Preclassic/Protoclassic workshops were concentrated in the central core area of Colha (Hester and Shafer 1994a). The Late Classic workshops also tend to be associated with residential structures. Another aspect of the Late Classic is the occurrence of workshop specialization. Workshops tended to specialize in a particular stage, type, and mode of production (King 2000:141).

However, unlike the Late Preclassic/Protoclassic period, it may have not been the occupants of Colha who were controlling raw material acquisition and production. Hester and Shafer (1994a:48) note that during the Late Classic several lithic workshops were in place along the chert-bearing zone between Colha and Altun Ha. The positioning of these workshops has lead Hester and Shafer (1994a:48) to suggest that Colha may have been under the aegis of Altun Ha during the Late Classic.

Shafer (1982b) states that Colha may have been a part of a larger network of sites that may have also included Altun Ha. Flaked stone symbols which have been attributed as representing elite structure and power decrease at Colha while increasing at Altun Ha during the Late Classic (Meadows 2001:17; Pendergast 1982).

Although Colha may have been part of a larger network of sites, it is clear that Altun Ha surpasses it in terms of monumental works, population, and access to symbols of power (including flaked stone symbols) (Pendergast 1982). The appearance of lithic workshops at Altun Ha and between Altun Ha and Colha (e.g. at Chicawate) further indicate control was not exclusively held at Colha as it had been during the Late Preclassic and Protoclassic (Meadows 1998; Kelly et al. 1979).

Material culture continues to be diversified in form and less in material. Import items of greenstone, shell, and obsidian are noted. Obsidian data reveals two Late Classic sources, Ixtepeque and El Chayal (Dreiss 1988). Only two specimens of Classic date are reported from the source that dominated the Colha Preclassic obsidian assemblage, San Martín Jilotepeque (Brown et al. n.d.). However, the amount (in terms of numbers), of exotic items is less than found during the Late Preclassic and Protoclassic periods.

Ceramically, the Late Classic is defined by the Late Classic Bomba complex and the Late to Terminal Classic Masson complex. The Tepeu 1-2 Bomba complex dates from A.D. 600 – 700. The Masson complex, a Tepeu 2-3 complex dates from A.D. 700 to 875.

The Bomba, Tepeu 1-2 complex, is dominated by the Mountain Pine Group (Valdez 1987, 1994a). Numerous slipped and unslipped-and-striated types are found including, Zibal unslipped, Jones Camp striated, and White Cliff striated (Valdez 1994a:13). Saturday Creek Polychrome and Saxche Orange-polychrome dominate the polychrome group. Continued ties with the Belize Valley are found in the types and modes in these two complexes.

The focus of intensified lithic production during the Late Classic is seen in the general utility bifaces, oval bifaces, macroblades, and flake stone symbols. Shafer and Hester (1983) suggest continuity, with some degree of style change, of three production systems from the Late Preclassic, the large oval biface, the tranchet bit, and macroblade implements. A continuity of production technology is also seen (Hester 1985a: 7). During the Late Preclassic/Protoclassic, flaked stone symbols tended to be large and thick. By the Late Classic, workshops were producing smaller thinner specimens as both bifacial items and notched blades, many in effigy style (Hester and Shafer 1994a:51; Meadows 2001).

The majority of domestic and public architecture at Colha was erected during the Late Classic. In addition to new construction activities, Late Preclassic/Protoclassic structures and plazas were expanded and enlarged. Raised walkways also appear between buildings. Of particular note is the enlargement and expansion of the Late Preclassic ballcourt at Operation 2009 (Eaton and Kunstler 1980). The Late Classic also brought with it advanced methods of construction techniques including the use of retaining walls, cut-stone veneers, and vaulted ceilings (Eaton 1982a, 1982b 1991; McAnany 1994). Hester (1985: 12) indicates that cut stone forms and workmanship is similar to that found in central and northern Yucatan and may indicate an affiliation with these areas.

Excavations have been conducted on many sizes, characters, and arrangements of Late to Terminal Classic structures at Colha. Architectural configurations include small patio groups, small to large plazuela groups, and small plaza groups (see Eaton 1982b:123-124, 1991). Domestic architecture is primarily comprised of rectangular to square walled structures supporting pole and thatch superstructures as seen at Operations 1002, 2003, 2006, 2007, 2008, 2032, and 2033 (Day and Laurens 1980; Escobedo 1980; Gibson 1982; McAnany 1994; Roemer 1979, 1980; Valdez 1994b). Associated features include interior burials, intrusive interior pits of unknown function, and middens (Escobedo 1980a; McAnany 1994). An example of monumental public architecture is found at Operation 2025 where the Late Classic construction phase is represented by a linear structure with vaulted ceilings and multiple doorways (Eaton 1994:105).

A unique architectural feature at Colha is a 2,500m^2 courtyard in the main plaza, which is at least partly paved with a mixture of plaster and crushed red pottery, producing a spectacular red surface (Eaton 1994:107). Another interesting element of Late to Terminal Classic architecture is the use of narrow passageways, possibly as a means of restricting access. Courtyards and plazuela groups at

Operations 2008, 2025, and 2033 all exhibit this architectural feature (Eaton 1982a, 1982b; Escobedo 1980a; McAnany 1994). Eaton (1991) also suggests that these passageways may have served as water drainage systems.

In addition to continued occupation of the core area (Operation 2035 and 2012) Late Classic settlement expanded into the 3000 and 4000 sectors of the site. King (1994:22) notes that the number of structures appears denser in the 3000 sector. Thus, the Late Preclassic settlement pattern of loose agglutination with single mounds changes slightly during the Late to Terminal Classic period (King 2000).

Evidence from Cobweb Swamp suggests a Late Classic date for the raised field system at this local (Jacob 1992, 1995). Pollen analysis indicates a variety of cultigens in use including corn, cotton, and possibly chili peppers (*Capsicum* sp) (Jones 1991). Further evidence of an agrarian population is found at Operation 4044, located 2 km^2 from Cobweb Swamp. Excavations at this structure produced several heavily battered general utility bifaces and oval bifaces. Use-wear analysis has indicated both forms are at least sometimes associated with land clearing (Nash 1986). Epstein (1990) has interpreted this assemblage and thereby the structure they were recovered from as belonging to farmers.

Burial data from both the Late Classic and Terminal Classic are found throughout the site (Escobedo 1980a; King 2001: 363-364). The majority of burials recovered from this period are associated with domestic architecture, however a small number are reported from workshop deposits (King 2001:364). Many of the Late to Terminal Classic burials are poorly preserved due in part to their proximity to the surface. Burial furniture is diverse in form but not in material.

Terminal Classic (A.D. 700 – 875)

Just as the beginning of the Classic period brought changes to Colha so to occur significant changes in the Terminal Classic. As previously stated, there is a general overlap between the Late Classic and the early facet of the Terminal Classic in terms of material culture (Valdez 1987, 1994a). This section will provide a review of those features that distinguish the Terminal Classic occupation from that of the Late Classic.

By the Terminal Classic, the dispersed population of the Late Classic period begins to draw inwards towards the central core area of the site. Hester (1985a:12) suggests “congregated occupation of this sort might represent the desire to settle in more secure and restricted areas.” Evidence of intentional destruction of architecture is seen at several locations across the site (Eaton 1994). Material culture analysis begins to indicate a shift in affiliation to the north with Yucatan.

The inclusion of new types in both the ceramic and lithic assemblage suggests changes in cultural and political interaction spheres. Trade items are primarily limited to shell, obsidian, and groundstone. The number of greenstone artifacts decreases dramatically. The obsidian resource area of El Chayal dominates, to the exclusion of others, during this period (Dreiss 1988:72).

The Masson ceramic complex, a Tepeu 2-3 composite, represents the Terminal Classic at Colha (Valdez 1987, 1994a). The Tinaja group dominates with Tinaja Red and Subin Red being the most prominent slipped types. Another major slipped type is Palmar Orange-polychrome occurring in a particular colors, a form primarily found in the northern Belize area (Valdez 1994a:14). The unslipped and unslipped-and-striated types are a continuation from the Late Classic, Tepeu 1-2 Bomba ceramic complex. The inclusion of the ceramic type Petkanche Orange-polychrome indicates a switch to the north in ceramic material culture affiliation. The inclusion of Yucatan trade wares (Ticul Thin Slate) in the assemblage leads Valdez (1994:14) to suggest that this affiliation is with Yucatan.

Stone tool production during the Terminal Classic basically represents a continuity of Late Classic forms with the exception of specialized blade workshops, an obsidian workshop, and the discontinuation of flaked stone symbols (Dreiss 1988; McGraw 1980; Woerner 1980; Hester and Shafer 1994a; Masson 1989; Roemer 1984). The Terminal Classic stemmed blade is smaller than its earlier counterpart and probably functioned as atlatl spear tips (Masson 1989; Roemer 1984). Roemer (1989:296) and Masson (1989:146-150) both suggest that this switch in size probably served to meet consumer demands for implements of war.

A small obsidian blade production workshop that produced over 445 blade fragments was noted at Operation 2012 (Dreiss 1988; McGraw 1980; Woerner 1980). Although originally attributed to the Late/Terminal Classic, the disturbed nature of its context suggests a possible Postclassic origin. These are the significant reasons for re-assessing the dating of the workshop. First, the workshop debris was recovered from proximity to the ground surface. Secondly, Potter (1980:175) states that the context from which these materials were recovered was badly disturbed. He further suggests that this disturbance is post depositional probably due to root and animal intrusions.

During the Late Classic, ritual activity is best viewed through the continued use of the ceremonial structure at 2012 and the ballcourt at 2009. By the Terminal Classic evidence suggests that the 2012 ceremonial structure ceased to be architecturally maintained (Potter 1982). However, two poorly constructed "shrine" like structures were erected at the base of the ceremonial structure along the staircase centerline. Thus suggesting the continued use of this space as a place of ritual activity.

A new type of activity, which is destructive in nature, is seen at Operations 2012 and 2025 during the Terminal Classic. At Operation 2012 hundreds of large Palmar Orange-polychrome plate fragments, obsidian, a greenstone artifact, and the remains of 25 individuals represented by disarticulated bone were recovered from the base of this structure (Barrett and Scherer 2002; Potter 1982; Scherer n.d.;

Valdez, personal communication 2001). Recent analysis of the 2012 human remains from this deposit suggests that the bones represent a primary deposit and not a secondary reburial (Scherer n.d.). Barrett and Scherer (2002) suggest that the 25 individuals represent casualties of "war." In the restricted alleyway at Operation 2025, a similar deposit of fragmented Palmar Orange-polychrome plates was found.

In 1980, excavations at Operation 2011 revealed a unique deposit at the site of Colha. This consisted of an 80 cm by 110 cm pit containing the decapitated and burned skulls of 10 children, 10 adult males, and 10 adult females (Steele et al. 1980; Massey 1989, 1994). The individuals represented in the skull pit exhibit cranial shaping and filed teeth, both likely signs of elite level personages (Massey 1989, 1994). The pit was located on the marl plaster surface just east of the central staircase of an elite structure. The only other associated artifacts were several large sherds, burned fragments of construction materials, animal long bones and ribs, one Pomacea shell, one unidentified gastropod shell, and chert flakes (Steele et al.1980; Valdez 1987). A chert eccentric, peccary teeth, and Pomacea scatter were recovered from the fill directly above the skull pit and may have filtered down into the feature (Steele et al. 1980). Two AMS dates obtained from the bone indicate a date for this deposit between A.D. 659 and A.D. 782 (Hester, personal communication in King 2000: 105). For information regarding the significance of these features the reader is referred to Barrett and Scherer (2002), Mock (1994, 1998) and Valdez (1989).

After deposition of the skulls, the structure at 2011 was destroyed and burned. Destruction and burning evidence is also found at the Operation 2012 ceremonial structure and at the monumental building at Operation 2025 (Potter 1982; Eaton 1994). This type of activity is not found in the residential areas of the site, rather it is limited to the ceremonial center and in particular to areas probably controlled by "elites." Evidence of destruction or burning points to the intentional targeting of the elites as well as the materials and physical locations that are representative of them. The destruction activities are part of the termination of the Classic period and occupation at Colha.

POSTCLASSIC (A.D. 950 –1400)

The Postclassic at Colha was originally assessed as representing an early facet of the Early Postclassic and a late facet of the Early Postclassic. Refinements in the ceramic and lithic assemblages have enabled a fine-tuning of the two facets. The early facet now corresponds to the Early Postclassic and the late facet to the Middle Postclassic. Not all ceramic and lithic lots have been re-analyzed and therefore, a general Postclassic category is also utilized in this study where early and late facets were not originally distinguished. Where possible, materials are ascribed to either Early Postclassic or Middle Postclassic.

The Postclassic at Colha is represented by three ceramic complexes, Early Postclassic Yalam (A.D. 950 - 1250), Middle Postclassic Canos (A.D. 1250 – 1300), and Late Postclassic Ranas (A.D. 1300 – 1400). With the exception of the Ranas complex, the Postclassic ceramic complexes of Colha are considered to be functionally complete (Valdez 1987, 1994). The Ranas complex is represented only by Mayapan-style (visitation) censers, Chen Mul Modeled (Valdez 1994a).

Following the apparent violent end of Colha during the Terminal Classic, the site remained unoccupied for a period of 50-100 years or until around A.D. 950. During this hiatus, Colha and the surrounding area were reclaimed by the natural environment. Material culture, faunal, and pollen analysis further support both a hiatus and regeneration of the landscape (Jacob 1992:70; Jones 1991: 61; Shaw and Mangan 1994).

The renewed landscape brought with it re-occupation by a new cultural group manifested through different traditions in material culture. In general, the Postclassic assemblage illustrates a strong affiliation direct, or indirect with northern Yucatan (Hester and Shafer 1991a, 1994a). The majority of data on the Postclassic has been recovered from excavations at Operations 2001, 2003, 2010, 2032, 2037, and 2040.

The major differences between the two phases of the Postclassic are found in the lithic, ceramic, and faunal assemblages. Settlement patterns are ubiquitous throughout the Postclassic at Colha. Because of this, the Postclassic will be reviewed in general and where available, those attributes that distinguish Early and Middle Postclassic will be presented.

The Early Postclassic at Colha is represented by the Yalam ceramic complex. Valdez (1994a:14) describes this complex as "a locally produced ceramic tradition of Yucatecan influence." Within this complex, the Augustine group dominates with the Zakpah Orange-Red being the most common type. Ceramic affiliations are found with the central Peten, northern Belize, and north into Quintana Roo (Valdez 1994b). Forms include comales, grater bowls, and slipped-and-handled jars (Valdez 1987:212). Another feature of the Early Postclassic complex is the abundance of handles and foot supports. According to Valdez (1994a) these forms represent a complete cultural change as well as a shift in resource orientation as compared to the Classic period.

The Middle Postclassic, Canos Complex, is a basic continuation of the previous Yalam complex. The Payil group dominates and the most common type is Payil Red. The major differences between the two complexes are found with Payil where the red slip is darker and surface treatment varies.

The Postclassic inhabitants were probably drawn to Colha because of its positioning within the Chert Bearing Zone (CBZ). This is supported by the documentation of 12 lithic workshops dating to the Early and Middle Postclassic (Barrett 1999; Hester et al. 1980; Hester and Shafer 1991a; Michaels 1994). Changes in both the organization and standardization of production are evident with production occurring at the household level (Barrett 1999; Hester and Shafer 1994a; Michaels 1989). The lithic assemblage does not display the standardization seen during the Preclassic and Late Classic.

Lithic forms dominating the Early Postclassic are side-notched dart points, the tapered biface, and triangular preforms (Hester 1982; Hester and Shafer 1991a; Shafer 1979). The Middle Postclassic sees the replacement of the side-notched dart point with lenticular and lozenge-shaped bifaces, their early stage preforms and triangular adze-like bifaces and their preforms (Hester and Shafer 1991a).

The new forms produced exhibit similarities with Yucatecan types in particular the side-notched dart points (Hester 1982; Hester and Shafer 1991a). Technological changes are also indicated through the recovery of soft hammer percussion implements in the form of antler billets and punches. This technological production strategy prevails in the Postclassic lithic assemblage (Hester and Shafer 1991a; Michaels 1994).

In addition to the utilization of the Colha chert, chalcedony was imported and worked (Michaels 1994). Obsidian also occurs, generally in larger quantities than previous occupations. Trace element analysis indicates the dominant source for obsidian was Ixtepeque (Dreiss 1988). The sample consists mainly of utilized blades, very few cores have been recovered. An exception exists be if the Terminal Classic obsidian workshop at Operation 2012 is in fact Postclassic as has been suggested.

Postclassic occupation at Colha can be characterized as being a small agrarian community (Hester and Shafer 1991a:155). Settlement patterns indicate that the Early Postclassic and Middle Postclassic occupation was restricted to the area in and around the monumental center. This limited occupation is suggestive of a greatly reduced population when compared to earlier periods of occupation. The domestic structures indicate that the Postclassic inhabitants utilized readily available construction materials to erect walls that supported pole and thatch superstructures (Eaton 1979, 1980b). Early Postclassic and Middle Postclassic artifacts have been recovered from the interior of Late Classic/Terminal Classic structures and midden deposits. The uninhabited structures probably served as trash receptacles. Postclassic construction has been revealed only at Op 2003 (Eaton 1979, 1980). No monumental architecture is attributed to the Postclassic occupation of Colha.

An interesting feature of the Postclassic is its midden deposits. Several large middens, a few associated with lithic production, are located around the monumental center and in particular its southern section. In-depth investigations into five Postclassic middens provided much data and artifactual material. These include three Early Postclassic to Middle Postclassic middens (2010, 2032, and 2037) and two Middle Postclassic middens (2001 and 2040). All five were meticulously excavated with the intent of recovering artifacts, faunal, and paleobotanical remains (Shafer 1979; Shafer and Michaels 1994; Taylor 1980;

Valdez 1994b; Shaw and Mangan 1994). The 110 cm thick deposit at Operation 2010 produced an array of stone tools, obsidian, groundstone, charred botanicals, and an abundance of faunal materials (Taylor 1980). The largest midden deposit excavated was the 2 meter thick midden at 2037 (Shafer and Michaels 1994).

Subsistence strategies may be best revealed through the paleobotanical and faunal remains. The paleobotanical data recovered from Operations 2001 and 2010 indicate the use of a variety of cultigens and tree-crops including maize (*Zea mays*), beans (*Phaseolus vulgariz*), cotton (*Gossypium hirstum*), achiote or annatto (*Bixa orellana*), bitter gourd (*Momordia sp.*), jauacte palm (*Bactis major*), epiphytic cactus (*Slenecereus* sp), supa (*Acrocomia mexican*), chicle (*Achras zapota*), papaya (*Carica papya*), and custard apple (*Annona reticulata*) (Caldwell 1980:261; Miksicek 1979:158).

The Early Postclassic to Middle Postclassic middens at Op 2010 and 2032 are dominated by supa, chicle, maize, papaya, annatto, and custard apple. The jauacte palm followed by, achiote, cotton, beans, and maize are found at the Op 2001 midden. A cursory examination indicates that the Postclassic occupants favored tree-crops and cultigens. However, this may be a reflection of the number and location of middens sampled.

Faunal data from Operations 2001, 2010, and 2032 all indicate the exploitation of both terrestrial and aquatic habitats (Scott 1979, 1980, 1982, 1983; Shaw and Mangan 1994). The Early Postclassic to Middle Postclassic midden at

Operation 2032 indicates a strong reliance on reptiles and mammals, in particular the turtle and white-tail deer (*Odocoileus virginianus)* and less on fish (Shaw and Mangan 1994). The Early Postclassic to Middle Postclassic midden at 2010 indicate a heavy reliance on marine fauna and reptiles (Scott 1981:203). The marine fauna consist of species that occasionally occur in fresh water and frequently in shallow estuaries and lagoons (Scott 1981). Although not presented in the analysis by Scott, mammal remains were abundant in the 2010 midden. Several antler tines and billets as well as bone pins and awls were recovered (Taylor 1980:135).

The fauna from the Middle Postclassic midden at Operation 2001 was comprised of only 18 identifiable animal species (Scott 1980:282). In the 2001 midden, aquatic animals (fish and turtle, in particular riverine species) prevail, while the white-tail deer is highly under-represented (Scott 1980). Clearly, the Postclassic occupants of Colha relied on a variety of plants and animals. The general trend however, is toward the use of aquatic and molluscan fauna. Through time, there is a dependence on a greater variety of species, although smaller in individual size (Scott 1980).

The only evidence of Postclassic ritual activity is found during the Late Postclassic in the form of Mayapan-style "visitation" censers at Operation 2012 (Valdez 1994b). Since the Early and Middle Postclassic occupants resided within the monumental center it is highly likely that the ceremonial structure at Operation

2012 was utilized as a place of worship. The fact that the only evidence of Postclassic ritual activity, albeit Late Postclassic, occurs at this local further acknowledges its roles as a recognized sacred place of worship.

CHAPTER 5

RAW MATERIAL: CLAY

CERAMIC ARTIFACTS

Although technically classified as sediment, the origin of clay is found in rocks (Rice 1987:33, 36, 51). Once clay in its natural form is secured, it undergoes a series of processes to render it suitable for use. This may include the removal of inclusions (picked and washed) and the addition of modifiers, referred to here as temper (Rice 1987:118). Once the desired consistency is achieved for the task at hand, the potters begin the processing of forming. The final steps in this process would be finishing, decorating, and firing the individual specimens.

Within the select portable material culture assemblage of Colha, two technological production strategies for artifacts derived from clay are represented, modeled clay and reworked ceramic sherds. Within these, a variety of artifact forms and subforms are found.

MODELED CLAY

This category is comprised of 55 artifacts whose final form was produced through hand modeling. Six artifact forms are represented, beads, figurines, wind instruments, spindle whorls, and notched pellets. A variety of subforms corresponding to morphology and/or function are found.

Although no evidence of mold made clay artifacts is present in this assemblage, the recovery of molds does confirm their use in the Maya area (Hammond 1975:372; Willey 1978:37-38; Willey et al. 1965:398-400). Molding clay involves the pressing of wet clay into prepared molds (see Rice 1987: 125 for more detail). Modeled items are produced through hand manipulation of clay into a variety of forms. For both forming strategies, surface decorations including perforations, slips, natural pigments, and appliqués, may be added prior to and/or after firing. Additional modifications and surface decorations may be applied after the firing process.

Modeled Clay Beads

Within the ceramic bead form category are found three subforms, all represented by one artifact (Table 5.1). The beads are reported from midden (n=2) and cache (n=1) contexts. The small sample size does not allow for the development of form types within this category. Each specimen was hand modeled and was perforated prior to firing. There is no evidence of slip or surface decoration. Similarly describes specimens are reported from other sites of the Maya area (Awe 1992; Coe 1959; Garber 1989; Hammond 1975; Kidder 1947; Lee 1969; Sheets 1978; Willey 1972; Willey et al. 1994).

Table 5.1. Modeled Clay Beads

Prov.	L	D	Th	Wt	Form	Context	Comments
early Middle Preclassic							
2012 5:15		1.01	0.39	0.30	Discoid	Cache	Unslipped
Middle Postclassic							
2032 5:2	1.99	1.24		3.25	Tubular	Midden	Unslipped
2040 1:2		0.87	0.82	0.60	Sub spherical	Midden	Unslipped

Modeled Clay Figurines

At Colha, three anthropomorphic figurine heads recovered from midden (n=2) and sub-surface contexts (n=1) represent this form category. All three were produced through hand modeling, appliqué, punctuating, and incising techniques. Two subforms are found, solid figurines and hollow figurines. Figurines are ubiquitous throughout the Maya area and first appear in abundance during the early Middle Preclassic and continue through to the Postclassic (Awe 1992; Coe 1959; Corson 1976; Hammond 1975; Ivic de Monterroso 1999; Kidder 1965; Piña Chan 1968; Sharer and Sedat 1987; Sheets 1978; Willey 1972, 1978; Willey et al. 1994). However, they are relatively rare at most sites during the Classic except for the Terminal Classic when they again become abundant (Adams 2002, personal communication). Exceptional quantities of figurines are noted from highlands sites during the Middle Preclassic especially at Kaminaljuyu (Kidder 1965; Wetherington) and Chalchuapa (Dahlin 1978; Sharer and Sedat 1987). Figurines vary from very simple to elaborate in execution.

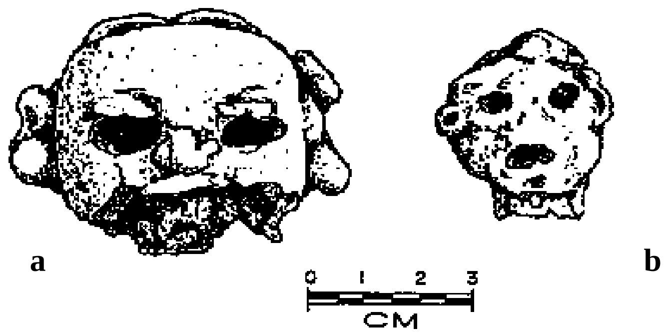


Figure 5.1. Modeled Clay Figurines: a) hollow (2032 8:2); b) solid (2032 8:2) (illustrations by Jennifer Bryan)

Modeled Clay Figurines: Solid

The single solid anthropomorphic figurine head, recovered from a Middle Postclassic midden at Colha, has oval shaped punctuated eyes and mouth (Figure 5.1.b; Table 5.2.). There is no remaining evidence of a nose as this area has been damaged. An appliquéd ear flare is found only on one side, its corresponding partner was damaged. The hair is in the form of a crest and is also partially fragmented. Overall, this specimen has the appearance of being crudely made. The Colha specimen most closely resembles examples from the free form style figurine heads at Chalchuapa (Dahlin 1978:183).

Table 5.2. Modeled Clay Figurines: Solid

Prov.	L	W	Th	Wt	Form	Context	Comments
Middle Postclassic							
2032 8:2	2.74	2.34	1.57	7.40	Head	Midden	Unslipped

Modeled Clay Figurine: Hollow

The two specimens that comprise this category were recovered from midden (n=1) and unknown (n=1) contexts (Table 5.3). The two hollow figurine heads Surface decorations and facial features were made prior to firing. Only the upper portion of the face remains intact for the Middle Postclassic three dimensional anthropomorphic figurine head from 2032 8:2 (Figure 5.1.a). It has hollow oval-shaped eyes and appliquéd eyebrows; its nose is also appliquéd. The other visible attributes include earflares and hair. The facial features of the second specimen (2037 13:L1) are cruder in their rendering. The appliquéd eyes bulge and are represented by incised slits. The nose is also appliquéd and two nostrils are indicated by punctuations. The hair is represented by a small crest and the ears by small protrusions. An interesting feature is the four incised lines that occur below at both corners of the mouth. These incision may represent facial scarification.

Table 5.3. Modeled Clay Figurines: Hollow

Prov.	L	W	Th	Wt	Form	Context	Comments
Middle Postclassic							
2032 8:2	3.43	4.34	3.07	18.2	Head	Midden	Unslipped
Postclassic							
2037 13:L1	3.45	3.75	3.69	27.1	Head	Subsurface	Unslipped

Modeled Clay Figurine Wind Instruments

Four modeled clay figurine wind instruments are reported from midden (n=2), burial (n=1), and unknown (n=1) contexts at Colha (Buttles 1992a; McGregor 1994). Zoomorphic and anthropomorphic ceramic figurine wind instruments including flutes, whistles, and ocarinas, are reported throughout the Maya area (Awe 1992; Brady 1990; Coe 1961; Garber 1989; Hammond 1975, 1991a; Healy 1989; Lee 1969; Sheets 1978; Willey 1965; Valdez and Buttles 1995; Willey et al. 1994). According to Lee (1969:66) a whistle is a single note instrument with no stops or ventages. An ocarina is "a multi-note instrument in which the resonating chamber has an open oval form and there are several ventages" (Lee 1969:66). One whistle and three ocarinas are reported from Colha (see also McGregor 1994). All four specimens were manufactured through modeling.

According to Hammond (1972), Healy (1988:30) and confirmed by the author, published reports often do not make distinctions between an ocarina and a whistle. The majority of this "type" of artifact is normally lumped under one category "whistles". If this distinction is not made, and if detailed photographs or illustrations are not provided, inter-site comparisons may only be at the level of whistle.

Healy (1988) and Welsh (1998) associate musical instruments with burials and funerary rituals. Welsh (1988) in particular associates whistles with infant/child burials. Although several sites report ocarinas and whistles from burial contexts including Late Preclassic Colha (Buttles 1992a), Late Preclassic Cerros (Garber 1989:90) and Early Classic Cuello (Hammond 1991a; McSwain et al. 1991:178), they are also noted in quantity from middens and construction fill. The site of Jaina, Campeche, Mexico, is perhaps the best example of the association of ceramic figurine winded instruments in burial context (Corson 1976; Piña Chan 1968).

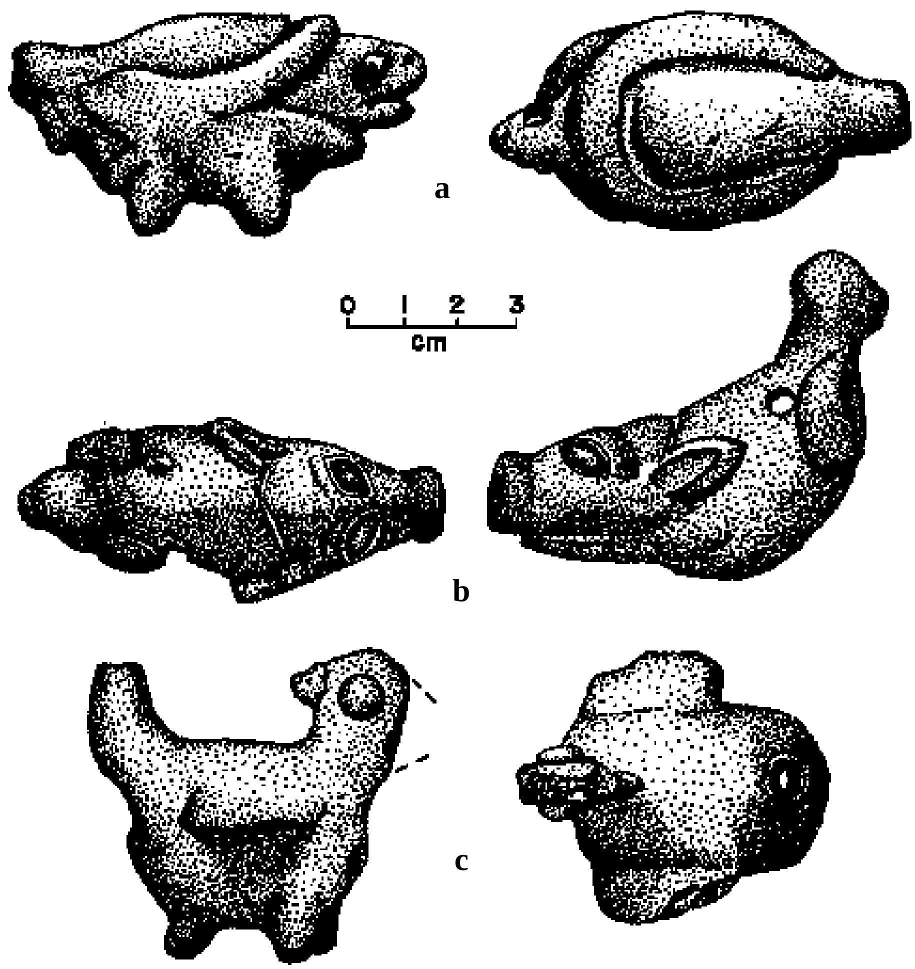


Figure 5.2. Modeled Clay Wind Instruments: a) turtle whistle (2032 7:1), b) peccary ocarina (2012 12:34), c) bird ocarina (2036 6:2), after McGregor (1994:253)

Modeled Clay Figurine Wind Instruments: Whistles

One specimen (2032 7:1) has been identified as a whistle.   It is a Middle Postclassic zoomorphic representation of a turtle that was recovered from a midden context (Figure 5.2.a; Table 5.4). The whistle stands on four legs, has a mouthpiece extending straight out from the tail, and an air hole just below the tail. The features of the turtle including its carapace were achieved through incising and the eyes were formed through appliqué and punctations. A similar Late Classic turtle whistle is reported from Seibal (Willey 1972:16).

Table 5.4. Modeled Clay Figurine Wind Instruments: Whistles

Prov.	**L**	**W**	**Th**	**Wt**	**Form**	**Context**	**Comments**
Middle Postclassic							
2032 7:1	7.40		3.98	49.2	Turtle	Midden	Unslipped

Modeled Clay Figurine Wind Instruments: Ocarinas

This category is comprised of two single note and one possible double note ocarinas recovered from midden (n=1), burial (n=1), and unknown (n=1) contexts (Figure 5.2.b-c; Table 8.5). The first single note ocarina (4045 4:5) is a Late Classic zoomorphic representation of a bird with a rounded body and no feet or wings. It is rather small for an ocarina. Its features include a mouthpiece extending from the tail, an air hole at the base of the tail, and a note hole on the top (birds back). The second ocarina (2036 6:2) is also a zoomorphic representation of a bird recovered from an unknown Postclassic context (Figure 5.2.c). Its mouthpiece extends straight up from the tail with an air hole at the base of the tail, and an additional note hole in the chest.   Its features include wings that extend from the body, appliquéd eyes, a partially missing crest, and a beak that has broken away. Ocarinas and whistles in bird form are common and are reported at several sites in the lowland Maya area including Preclassic Blackman Eddy (Hartman and Pagliaro 2000), Middle to Late Classic Cahal Pech (Awe 1992), Middle Preclassic and Late Classic Chiapa de Corzo,(Lee 1969:66-70), Late Classic Copan (Willey et al. 1994), Early Classic Cuello (McSwain et al. 1991:179), and Late Classic Seibal (Willey 1978:19).

Table 5.5. Modeled Clay Figurine: Ocarinas

Prov.	L	W	Th	Wt	Form	Context	Comments
Protoclassic							
2012 12:34				19.89	Peccary	Burial “adult”	Fragmented; surface may have originally contained a red slip
Late Classic							
4045 4:5	4.60	2.51	2.38	12.97	Rounded Bird	Unknown	Unslipped gray
Postclassic							
2036 6:2	5.28		5.31	43.4	Bird	Unknown	Unslipped orange

The possible double note ocarina is a zoomorphic representation of a Peccary recovered from Protoclassic burial at Op 2012 12:34 (Figure 5.2.b). This specimen was very fragile, due mainly to its under-fired condition, and was fragmented shortly after illustration. The illustration denotes a straight and extended mouthpiece and two parallel note holes along the sides of the body. It is assumed that the air hole was positioned just below the tail as is in the other examples from Colha.

Modeled Clay Spindle Whorls

The spindle whorl category is comprised of 25 specimens recovered from midden (n=16) and construction related (n=9) contexts (Figure 5.3; Table 5.6; Gillis 1982; McGregor 1994; Valdez and Gillis 1980). Only four whorls were available for this analysis, data on the remaining specimens were obtained from published reports (Gillis 1982; McGregor 1994; Valdez and Gillis 1980).

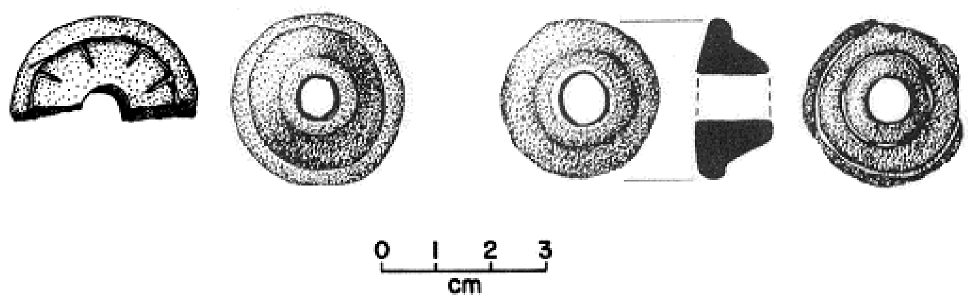


Figure 5.3. Molded Ceramic Spindle Whorls (after McGregor 1994:247)

Table 5.6. Modeled Ceramic Spindle Whorls

Prov.	D	Th	PD	Wt	Context
Early Postclassic					
CH78A	3.70	2.20	0.76	13.90	Midden
CH78A	2.10	1.80	0.89	8.10	Midden
CH78A	3.13	2.05	1.01	13.77	Midden
CH78D	3.70	1.10	1.20	9.80	Midden
CH78D	2.30	1.90	0.78	9.60	Midden
CH78D	3.20	1.27	1.30	9.55	Midden
Middle Postclassic					
2001 4:1	3.40	1.10	1.10	11.30	Midden
2001 11:2	3.17	1.31	1.05	11.12	Midden
2032 8:1	3.08	1.57	0.83	13.90	Midden
2032 8:1	2.82	1.35	0.98	6.90	Midden
2032 4:1	3.32	1.66	0.87	14.30	Midden
2032 9:1	3.10	1.36	0.90	10.00	Midden
2032 9:2	3.30	1.26	0.96	8.00	Midden
2032: 10:1	2.94	1.44	1.00	11.50	Midden
2037 1:L2	3.08	1.64	0.89	6.51	Midden
Postclassic					
2002 4:1	2.90	1.40	1.50	9.10	Rubble
2002 4:1	2.89	1.42	1.18	8.86	Rubble
2002 3:1	2.80	1.50	0.88	9.40	Rubble
2002 3:1	2.87	1.42	0.98	9.20	Rubble
2002 5:1	3.20	1.30	0.87	7.70	Rubble
2002 5:2	2.70	1.90	0.78	9.60	Rubble
2002 5:2	2.40	1.80	0.78	5.80	Rubble
2002 5:2	2.92	1.27	0.97	9.31	Rubble
2002 5:2	2.16	1.18	0.86	5.52	Rubble
2032 5:3	3.34	1.53	0.90	8.50	Midden

The Colha spindle whorls were produced though hand modeling techniques. Pre-firing perforations and decoration consisting of encircling grooves and incising are present on several specimens. There exists no evidence of a slip however, the surface of one specimen (2002 3:1) does appear to have been burnished. The bases of the whorls range from flat to rounded. The tops range from flat to graduated multiple tiers.

The plain style illustrated from the Colha collection (Figure 5.3) seems to be indicative of Postclassic whorls. Classic period whorls display a much greater investment in decoration (see Willey 1972:83). It is highly probable the majority of elaborately decorated Classic period whorls were produced through the use of molds. Postclassic whorls seems to be more expediently produced.

Molded and modeled spindle whorls are an artifact type that is ubiquitous throughout the Mesoamerica area (cf. Arroyo 1993; Coe 1959; Eaton and Farrior 1989; Becquelin and Taladoire 1990; Garber 1989, 1995; Hendon 1987; Lee 1969; Muñoz Gálvez 1967; Murray 1997; Sheets 1978; Swartz 1967; Tierney 2000; Valdez and Buttles 1995; Willey 1972, 1978; Willey et al. 1962, 1994). Their occurrence in the lowlands is most common to Classic and Postclassic contexts. They are however reported from Preclassic contexts in the South coast region of Guatemala at the site of Balberta (Arroyo 1993; Arroyo and Bove 1991; Bove 1991). At Cuello, Hammond (1991:179) reports one spindle whorl from a Late Preclassic context. The remaining Cuello specimens are from Classic deposits.

The spindle whorl has ethnographically been confirmed to function as a flywheel in the activity of spinning thread (Hicks 1994). Joyce (2000:53) suggests that by the Classic period the activity of spinning is associated with adult women and womanhood. Spindle whorls from Balberta dating to the Preclassic and Early

Classic were recovered from both male and female burials (Arroyo 1993; Arroyo et al. 1993). The spindle whorl was just one piece of a larger kit utilized by weavers in the production of thread and textiles (see Hendon 1987:38; Mastache 1996:19). Some of the best evidence regarding the technologies behind ancient textile production is derived from Codices (see Anawalt 1981).

The whorl served as a balance and provided the necessary weight to achieve the action of spinning. The weight of the whorl has been linked to the type of material being spun. According to Smith (1988:350), cotton required a smaller and lighter whorl whereas maguey or other fibrous materials a much heavier whorl. Weavers today in the village of Nebaj in the highlands of Guatemala use wooden spindles and round to ovoid wooden whorls when spinning cotton or wool. Spinning occurs in either a gourd or ceramic bowl (personal observation, 1991). A painted Late Postclassic wooden spindle whorl and a wooden spindle with whorl are reported from the Cenote of Sacrifice (Coggins and Shane 1984:146).

Modeled Clay Stamps

Included in this form category are two subforms, cylindrical and flat. One specimen represents each subform and each was produced through hand modeling techniques. Both specimens were recovered from a Postclassic midden at Op 2037. The designs were produced through pre-fire incising and cutting. Ceramic stamps are reported throughout the Maya area in a variety of forms (cf. Coe 1959; Garber

1978; Lee 1969; Sheets 1978; Willey 1974;Willey et al. 1994) The specimens in the Colha collection fall within the range of forms reported.

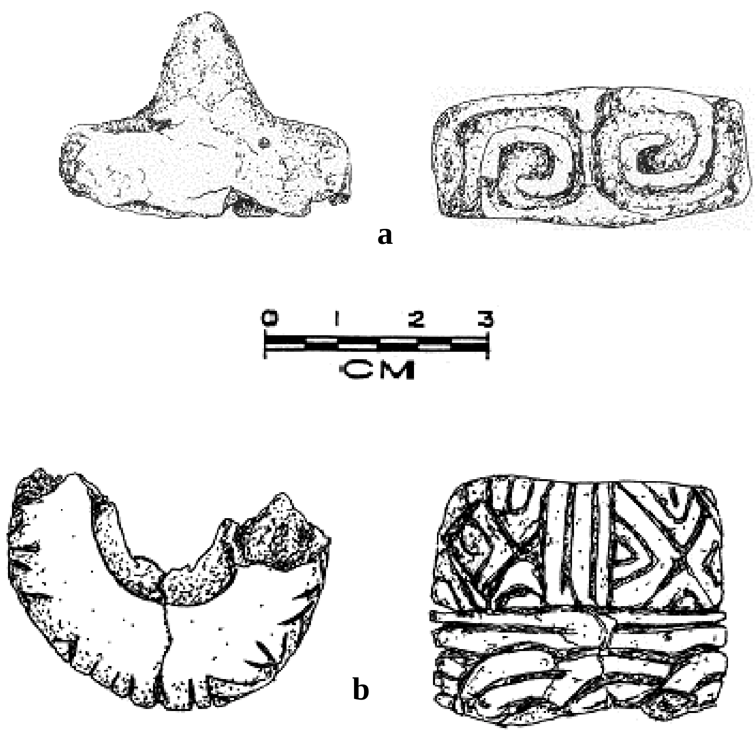


Figure 5.4. Modeled Clay Stamps: a) flat, b) cylindrical (illustrations by Jennifer Bryan)

Modeled Clay Stamp: Cylindrical

The cylindrical stamp, recovered from a Postclassic midden context, is fragmented with about one quarter of the design remaining (Figure 5.4.b; Table 5.7). The intact portion of the specimen displays a series (three visible) of low relief geometric panels that are separated by horizontal and vertical bands. A central hole/perforation might have held a wooden rod that could have functioned as a handle that would allow for hands free pressure. Cylindrical stamps are reported from Chalchuapa (Sheets 1978), Copan (Willey et al. 1994), Cuello (Hammond 1991), Copan (Willey et al. 1994), and Dos Hombres (Valdez and Buttles 1995).

Table 5.7. Modeled Clay Stamp: Cylindrical

Prov.	L	D	Th	Wt	Context	Comments
Postclassic						
2037 11: 2	4.32	5.20	2.04	78.74	Midden	Geometric low relief design incised prior to firing; fragmented

Modeled Clay Stamp: Flat

The flat stamp, recovered from a Postclassic midden context, displays a low relief geometric design consisting of two scrolls (Figure 5.4.a; Table 5.8.). A solid conical handle extends upwards from the center of the specimen. Flat stamps with varying geometric depictions are reported throughout the Maya area (Coe 1961; Demarest 1986; Hammond 1991; Sheets 1978; Willey et al. 1994).

Table 5.8. Modeled Clay Stamp: Flat

Prov.	L	W	D	Th	Wt	Context	Comments
Postclassic							
2037 11:2	5.50	2.44	1.00	1.81	38.98	Midden	ntact but part of esign has broken way; low relief eometric design ncised prior to iring; two scrolls

Modeled and Notched Clay Pellets

Excavations have produced 18 modeled and end notched clay pellets from midden (n=9), construction related (n=8), and subsurface (n=1) contexts (Figure 5.6; Table 5.9). Modeled and notched clay pellets are round to ovoid in form with deep post firing notches on opposing ends of the long axis of the specimens. The notches are generally V shaped. Technically they could be classified as end notched pellets. The fired clay color ranges in hues of gray, brown, orange, and red. No specimens exhibit any signs of slip, pre, or post-fire designs.

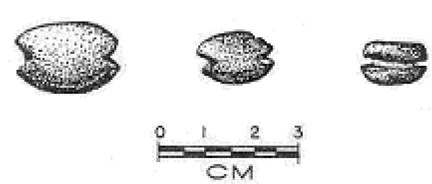


Figure 5.6. Modeled and End Notched Clay Pellets (after Valdez and Gillis 1980:331)

This artifact form is reported from several sites in the lowland Maya area and is most commonly associated with Postclassic contexts (Buttles n.d.; Hammond 1975). The most commonly attributed function is that of net weights (Eaton 1976). However, two of the Colha specimens were recovered from within a ceramic vessel foot (Valdez and Gillis 1980). It is highly possible that many of these specimens could have functioned as ceramic vessel feet rattles. Therefore, a single function is not easily assigned to this classification of artifact.

Table 5.9. Modeled and End Notched Clay Pellets

Prov.	**L**	**NL**	**W**	**Th**	**Wt**	**Context**
Middle Postclassic						
2001 12:2	1.61	1.08	1.26	0.68	1.47	Midden
2032 4:2	1.59		1.40	1.10	2.20	Midden
2032 8:2	1.94	1.43	1.62	1.03	3.54	Midden
2032 8:2	1.51	1.05	1.45	1.22	2.00	Midden
2032 8:2	2.94	2.05	2.12	1.34	9.47	Midden
2032 8:2	1.54	0.91	1.31	0.94	1.89	Midden
2032 8:2	1.41	1.00	1.03	0.77	1.26	Midden
Postclassic						
2002 5:1	1.47	1.00	1.10	0.84	1.37	Rubble
2002 5:1	2.28	1.78	1.78	1.35	6.28	Rubble
2002 5:1	1.86	1.05	1.19	0.84	1.26	Rubble
2003 14:2	1.82	1.17	1.60	1.28	3.93	Rubble
2003 14:2	1.68	1.17	1.61	1.36	4.07	Rubble
2003 14:2	2.07	1.36	1.72	1.45	5.89	Rubble
2003 14:2	1.76	1.31	1.56	1.35	4.10	Rubble
2003 14:2	2.23	1.65	1.79	1.40	6.39	Rubble
2031 4:2	1.57	1.00	1.38	0.98	2.13	Subsurface
2032 8:3	1.56	1.02	1.16	1.09	2.41	Midden
2032 9:3	1.55		1.20	1.00	2.50	Midden

Assuming a function of net weight, the size and weight of this artifact suggests that they were probably used (in groups). Their size and weight is likely a reflection of the environment in which they were used. When fishing by net, the deeper and more turbulent the water the heavier the weight requirement. Whereas, smaller weights such as the end notched pellet would suffice for small shallow bodies of water. The species fished would also be a factor in the selection of net or line weights.

REWORKED CERAMIC SHERDS

This category is comprised 242 artifacts manufactured from ceramic sherds and represents the cultural behavior of reuse. The techniques utilized in the production of this class of artifacts are not complex and could have occurred at the household level on an as needed basis. The various form and subforms represented were produced through the production techniques of breaking, flaking, cutting, and grinding. The subtractive nature of the production process accounts for slight variations within form and subform categories.

Four form categories represented are notched sherds, sherds, disks, pendants, and miscellaneous. Within each form category subforms are established corresponding to a commonality of overall morphology. The forms represented in the Colha assemblage conform to those reported from sites throughout the Maya lowlands. As a raw material, ceramic sherds were probably accessible to all levels of society. Household midden deposits could have served as a source. In several cases the reworked ceramic sherd artifact was manufactured from a ceramic type:

variety that predates its depositional context. This may be an indication of either the procurement of ceramic sherds from older midden deposits or curation.

Notched Ceramic Sherds

Notched ceramic sherds are reported throughout the Maya area and in abundance at sites positioned along or near coastal waters, lakes, and streams (Buttles 1994b; Connor 1975; Eaton 1976; Garber 1989; Graham 1994; Phillips 1978). A total of 174 notched sherds are reported from Colha (Buttles 1992a; Gillis 1982; McGregor 1994; Valdez and Gillis 1980). Notched sherds refer to ceramic sherds which have been reworked into an overall form that is round, oval, or square with notches on opposing sides. The notches may be U to V in shape and are positioned along the short or long axis of the specimen. In some cases an encircling groove running along the notch axis is present. Edge finishing ranges from smooth to rough-and- ragged. In the Colha assemblage, three subforms of notched sherds are found, end notched, side notched, and notched and girdled (Figure 5.6). Notched and girdled sherds have the addition of an encircling groove running along the notch axis.

As previously illustrated, the notched sherd form is also represented in modeled clay. Although similar in form and ascribed function, distinct differences are seen in size and weight. The size and weight differences may actually represent functional differences. The average length of the Colha notched sherd collection is

2.97 cm (standard deviation .95 cm). The average weight is 2.27g (standard deviation .79 cm). Length and weight averages and standard deviations are provided for each artifact of the three subforms under their subheadings.

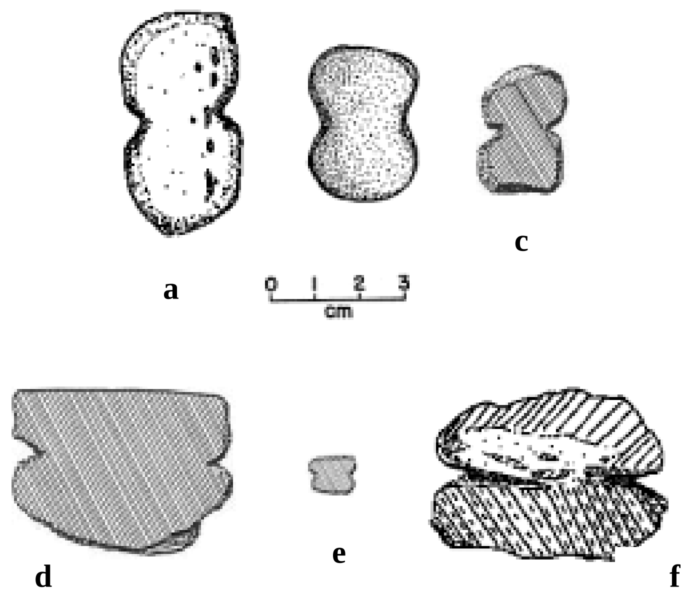


Figure 5.6. Notched Ceramic Sherds: a-c) side notched, e-g) end notched.

The most commonly ascribed function of notched sherds is net or line weights as used in fishing. Eaton (1976:241) provides an illustrated example of how notched sherds may have been strung (Figure 5.7). Support of this functional assignment is provided from use-wear studies, ethnographic comparisons, and faunal assemblages (Eaton 1976, 1978; Garber 1988, 1989, McKillop 1984;

Phillips 1978; Shaw 1992; Willey 1972). The contextual and faunal record at Colha support this functional interpretation (Buttles 1992a). Additional functions have been proposed and include weft weights, warp weights, curtain weights, and pendants (Kent and Nelson 1976; Willey 1972, 1978).

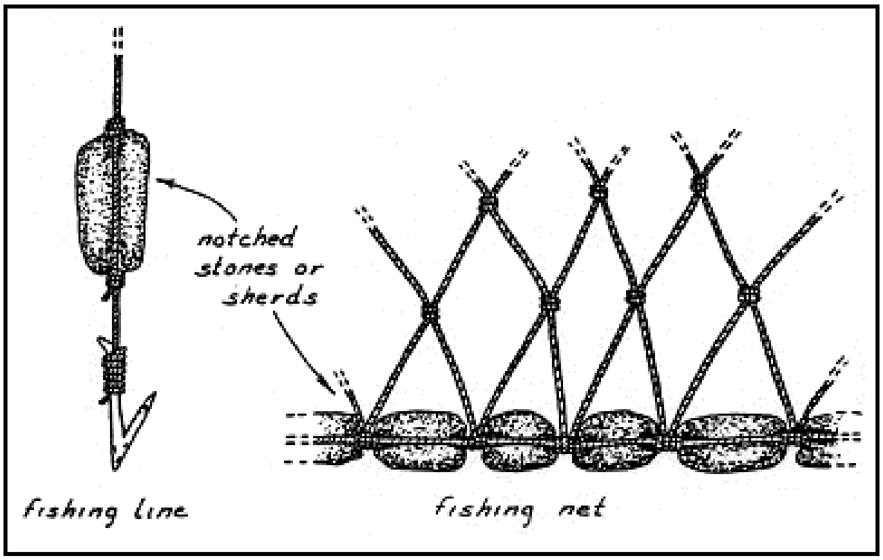


Figure 5.7. Suggested use of notched stone or ceramic sherds (after Eaton 1976:241)

As can be seen in Table 5.10 and Table 5.11, there is a variance in the overall size and weight of the notched sherds. Sites located near large open bodies of water should report larger heavier weights while smaller lighter weights should dominate sites near smaller shallow bodies of water (Buttles 1992a; Eaton 1976; Garber 1989; Phillips 1978). In order to ascertain this type of data it is imperative that data regarding the ancient environment be known. Carved depictions of boats recovered from the sites of Altun Ha (Pendergast 1979) Moho Cay (McKillop 1984) and Tikal (Trik 1963) support the existence of boat travel. Boats would have enabled travel to larger open bodies of water where large marine animals could be procured.

Notched Ceramic Sherds: Side Notched

The subform of side notched ceramic sherds display notches along the short axis on opposing sides. This subform is comprised of 42 specimens recovered from construction related (n=19), midden (n=17), unknown (n=4), cache (n=1), and intrusion pit (n=1) contexts. The average length of the Colha side notched sherd assemblage is 3.33 cm (standard deviation .94 cm) and the average weight 8.10 g (standard deviation 9.83 g) (Figure 5.6 a-c; Tables 5.10, 5.11, and 5.12). Data for six specimens (denoted by an *) was taken from Gillis (1981). Specimen length was used to establish three arbitrary categories of small, medium, and large. Small side notched sherds have a length 3.0 cm or less. There are 14 specimens in this category displaying an average length of 2.46 cm (standard deviation 51 cm) and a standard weight of 5.91 g (standard deviation 2.13 g) (Table 5.10). Medium side notched sherds range from 3.1 cm to 5.0 cm. There are 21 specimens represented with an average length of 3.66 cm (standard deviation .51 cm) and an average weight of 12.42 g (standard deviation 7.8 g) (Table 5.11). The final category of large side notched sherds is comprised of three specimens with a minimum length of 5.1 cm (Table 5.12). The average length for the large variety is 6.02 cm (standard deviation .80 cm) and an average weight of 42.45 g (standard deviation17.32 g).

Table 5.10. Notched Ceramic Sherds: Side Notched Small

Prov.	L	W	Th	Wt	Ceramic Type	Context	Comments
early Middle Preclassic							
2031 5:224	3.00	2.37	0.65	7.11	Ramgoat Red	Construction fill	
late Middle Preclassic							
2012 5:10	3.00	2.46	0.86	7.30	Consejo Red	Construction fill	
2012 5:10	3.00	2.60	0.90	7.50	Consejo Red	Construction fill	Rim sherd
Late Preclassic							
2003 22:9-10	2.76	2.20	1.20	8.99	Eroded	Rubble	
2003 14:5	1.70	1.74	0.51	2.10	Eroded	Intrusion Pit	
2031 2:25	2.04	2.08	0.96	6.30	Joventud Red	Midden	
2031 2:25	2.46	2.36	0.68	5.80	Joventud Red	Midden	
Protoclassic							
2003 22:8W	2.83	1.02	6.90	8.10	Eroded	Rubble	
2003 22:8W*	2.40	2.21	0.70	4.50		Rubble	
2003 22:8W*	2.90	2.02	0.80	7.80		Rubble	
2003 22:8W*	2.90	1.91	1.00	6.90		Rubble	
2031 2:23	2.70	2.48	0.42	4.63	Sierra Red	Secondary deposit	
Middle Postclassic							
2001 11:10	2.16	1.31	1.09	4.42	Eroded	Rubble	Edges very smooth
2001 11:11*	4.80	3.30	1.60	36.4		Midden	

Table 5.10. Notched Ceramic Sherds: Side Notched Small (continued)

Prov.	L	W	Th	Wt	Ceramic Type	Context	Comments
2010 1:2	2.81	2.47	0.82	6.24	Payil Red	Midden	Fragment; edge with opposing notch missing
2032 4:1	1.38	1.47	0.48	1.19	Eroded	Midden	
2032 7:2	2.67	2.24	0.93	6.86	Eroded	Midden	
Unknown							
2007: ?	2.49	2.08	0.76	5.27	Eroded	Construction fill	

Table 5.11. Notched Ceramic Sherds: Side Notched Medium

Prov.	L	W	Th	Wt	Ceramic Type	Context	Comments
early Middle Preclassic							
2031 3:38A	3.72	2.78	0.86	10.48	Joventud Red	Midden	
2031 3:38A	3.49	2.38	0.71	8.90	Joventud Red	Midden	
2031 3:38A	3.12	2.05	0.71	6.05	Joventud Red	Midden	
2031 5:224	3.47	2.81	0.54	7.56	Ramgoat Red	Construction fill	
2031 5:224	3.49	2.50	0.58	7.53	Ramgoat Red	Construction fill	
2031 6:191	4.30	3.40	0.60	14.00	Consejo Red	Floor and rubble	Partially burnt with a line of slip extending from notch to notch
2012 12:11	3.40	3.20	0.30	2.00	Joventud Red	Possible post mold	
late Middle Preclassic							
2012 5:10	3.20	2.80	0.70	9.50	Consejo Red	Construction fill	

Table 5.11. Notched Ceramic Sherds: Side Notched Medium (continued)

Prov.	L	W	Th	Wt	Ceramic Type	Context	Comments
Late Preclassic							
2003 22:9-10	3.23	2.55	0.69	8.10	Unidentifiable	Unknown	
2031 2:25	3.84	3.20	0.51	7.44	Joventud Red	Midden	
2031 2:25	3.59	3.31	0.82	11.28	Eroded	Midden	
2031 2:25	3.84	3.20	0.51	7.44	Joventud Red	Midden	
Protoclassic							
2003 22:8W	3.56	3.21	1.31	21.68	Unidentifiable Rim	Wall clean-up	
2031 2:23	2.70	2.48	0.42	4.63	Sierra Red	Secondary deposit	
Late Classic							
2012 10:4	4.72	3.09	1.31	24.80	Unidentifiable Rim	Unknown	
2012 12:17	3.46	3.05	0.91	11.76	Joventud Red	Unknown	
1002 1:3	4.13	2.53	0.88	9.82	Eroded Rim Sherd	Rubble	
Early Postclassic							
2010 1:7*	3.85	2.26	0.72	11.00		Midden	
2012 12:14	3.03	2.85	0.84	7.73	Red	Unknown	
Middle Postclassic							
2001 11:11*	3.33	4.75	1.62	36.40		Midden	
2010 1:6*	3.34	6.13	0.77	11.40		Midden	

Table 5.12. Notched Ceramic Sherds: Side Notched Large

Prov.	L	W	Th	Wt	Ceramic Type	Context	Comments
early Middle Preclassic							
2031 5:186	6.40	5.80	0.90	53.00	Chicago Orange: Warrie Camp Variety	Floor and rubble	
late Middle Preclassic							
2031 6:106	6.55	4.00	1.58	51.90	Society Hall	Midden	
Late Preclassic							
2009 1:4	5.10	2.70	1.24	22.46	Eroded Rim	Cache floor clean-up	

According to Garber (1989) the side notched form is most commonly recovered as a single find, while the end notched variety is found in groups. This lead Garber (1989:83) to suggest that the side notched sherd probably served as line weights. Three deposits at Colha produced side notched sherds in groups of three and four. These occurrences are limited to Middle Preclassic and Late Preclassic midden contexts implying line use at an early time.

Notched Ceramic Sherds: End Notched

End notched ceramic sherds refers to specimens that exhibit notches along their long axis on opposing sides (Figure 5.6d-f). At Colha 128 end notched sherds have been recovered from midden (n=113), construction related (n=5), and unknown (n=10) contexts. The majority of notched sherds (n=170) from Colha fall under this subform category (Table 5.13, 5.14, 5.15, and 5.16). The average length of the 119 complete end notched sherds is 2.90 cm (standard deviation .90 cm) and an average weight of 6.75 g (standard deviation 5.87 g). Specimen length and completeness was used to establish arbitrary size categories of small, medium, large, and fragments. The small end notched category is comprised of 66 specimens with a length of 3.0 cm or less (Table 5.13). The average length of the small category is 2.28 cm (standard deviation .44 cm) and an average weight of 3.47 g (standard deviation 2.13g). Medium end notched sherds range from 3.1 cm to 5.0 cm. There are 59 specimens represented with a average length of 3.60 cm (standard deviation .51 cm) and an average weight 9.95 g (standard deviation 7.8 g) (Table 5.14). The final category of large side notched sherds is comprised of two specimens with a minimum length of 5.1 cm (Table 5.15). The average length of the large variety is 5.96 cm (standard deviation .80 cm) and an average weight of 35.13 g (standard deviation 17.32 g).

The function attributed to end notched sherds is that of net or line weights (Eaton 1976, 1978; Garber 1989; Phillips 1978). Cerros, a site that is and was prehistorically situated on a lagoon reports 333 specimens of the end notched variety, whereas only 54 are of the side notched variety (Garber 1989). Garber (1989) reports that end notched sherds where usually recovered in groups, leading him to suggest that end notched sherds in these contexts represent net weights from decomposed nets. In regards to the notched sherd collection at Cuello, Hammond et al. (1992:10) report, "that most lay in an overlapping cluster, as though they had been deposited in some perishable container". It is not stated whether the net weights are of the side or end notched variety, but in either case, it is possible that the Cuello notched sherds were part of a decomposed net which would account for their close proximity as in the case of Cerros. At Colha, the majority of end notched sherds were recovered in groups from Postclassic midden deposits. Thus further supporting their likely use as net weights as suggested by Garber (1989).

Sites in close proximity to the ocean and large open bodies of water such as lagoons, often report large quantitative of notched sherds and in particular the end notched variety. Of the notched sherd collection from the Northern River Lagoon site, only one specimen of the side notched form is reported, the majority being of the end notched form (Buttles 1994). The faunal records from Cerros (Preclassic), Northern River Lagoon (Terminal Classic), and Colha (Preclassic to Postclassic) indicate fishing was an important activity (Valdez and Mock 1991; Shaw 1991a).

Table 5.13. Notched Ceramic Sherds: End Notched Small

Prov.	**L**	**W**	**Th**	**Wt**	**Ceramic Type**	**Context**
Late Preclassic						
2003 22:7	2.73	1.29	0.55	2.05	Sierra Red	Rubble
2003 22:9-10	2.84	2.60	0.51	5.00	Eroded	Rubble
2003 22:9	2.07	1.75	0.56	2.94	Eroded	Unknown
2003 22:9	2.42	2.11	0.61	3.50	Eroded	Unknown
Early Postclassic						
2010 1:7	2.45	2.21	0.76	6.10	Eroded	Midden
2010 1:7	2.66	1.81	0.78	5.90	Eroded	Midden
2010 1:7	2.96	1.82	0.94	7.70	Eroded	Midden
2010 1:7	3.00	2.31	0.82	7.90	Unslipped gray rim	Midden
2010 1:7	4.42	3.33	0.88	16.00	Eroded	Midden
2010 1:7	4.80	3.62	0.88	19.70	Eroded	Midden
2010 1:7	3.00	2.03	0.68	5.60	Eroded	Midden

Table 5.13. Notched Ceramic Sherds: End Notched Small (continued)

Prov.	L	W	Th	Wt	Ceramic Type	Context
Middle Postclassic						
2001 1:1	2.24	1.55	0.88	4.00	Eroded	Midden
2001 5:2	2.78	2.17	0.53	4.20	Eroded	Midden
2001 11:3	2.11	1.60	0.55	2.70	Eroded	Midden
2001 11:3	2.66	1.88	0.61	4.10	Eroded	Midden
2001 11:3	2.69	2.04	0.83	6.80	Eroded	Midden
2001 11:3	2.66	1.66	0.74	4.40	Eroded	Midden
2001 11:5	2.33	1.18	0.75	3.00	Eroded	Midden
2010 1:1	2.85	2.30	0.74	6.00	Eroded	Midden
2010 1:4	2.23	1.96	0.69	2.90	Eroded	Midden
2010 1:4	2.97	2.31	0.71	6.70	Eroded	Midden
2010 1:5	2.73	2.36	0.79	6.70	Eroded	Midden
2010 1:6	2.24	2.11	0.78	4.40	Eroded	Midden
2010 1:6	2.58	1.60	0.66	4.20	Eroded	Midden
2010 1:6	2.59	1.85	0.61	4.30	Eroded	Midden
2032 1:?	2.02	1.87	0.64	2.91	Sierra Red	Midden
2032 2:2	1.92	1.67	0.56	2.32	Payil Red	Midden
2032 2:2	1.59	1.10	0.73	1.60	Payil Red	Midden
2032 4:1	1.46	1.26	0.67	1.59	Sierra Red	Midden
2032 4:1	1.86	1.36	0.62	2.06	Eroded	Midden
2032 4:1	2.56	1.72	0.75	3.71	Sierra Red	Midden
2032 4:1	1.92	1.77	0.60	2.57	Eroded	Midden
2032 4:1	1.69	1.44	0.59	1.89	Payil Red	Midden
2032 4:1	1.46	1.26	0.67	1.59	Sierra Red	Midden
2032 5:1	2.95	2.04	0.47	3.74	Payil Red	Midden
2032 5:1	2.53	2.29	0.68	5.39	Payil Red	Midden
2032 5:1	2.51	1.70	0.49	2.70	Payil Red	Midden
2032 5:2	2.53	1.24	0.56	2.44	Payil Red with incising	Midden
2032 5:2	2.32	1.98	0.83	5.38	Eroded	Midden
2032 5:2	2.07	2.25	0.68	3.33	Payil Red	Midden
2032 5:2	2.72	1.84	0.63	3.48	Eroded	Midden
2032 5:2	1.70	1.49	0.49	1.47	Eroded	Midden
2032 5:2	1.46	1.15	0.54	0.97	Eroded	Midden
2032 5:2	1.56	0.88	0.59	1.13	Payil Red	Midden
2032 5:2	1.69	1.29	0.73	1.87	Eroded Rim	Midden
2032 5:2	2.40	0.92	0.51	1.30	Payil Red	Midden
2032 5:2	2.28	1.63	0.49	2.10	Eroded	Midden

Table 5.13. Notched Ceramic Sherds: End Notched Small (continued)

Prov.	L	W	Th	Wt	Ceramic Type	Context
2032 5:2	1.50	1.14	0.71	1.50	Eroded	Midden
2032 5:2	4.36	2.85	0.83	13.57	Eroded	Midden
2032 5:2	4.87	2.75	1.09	14.18	Eroded	Midden
2032 6:1	2.02	1.46	5.65	1.99	Payil Red	Midden
2032 8:1	2.01	1.17	0.50	1.27	Payil Red	Midden
2032 8:2	2.56	1.65	0.63	3.26	Payil Red	Midden
2032 8:2	2.73	1.29	0.55	2.05	Payil Red	Midden
Postclassic						
2032 8:3	2.25	1.72	0.64	3.06	Sierra Red	Midden
2032 8:3	2.85	1.78	0.56	3.47	Sierra Red	Midden
2032 8:3	2.01	1.45	0.57	1.97	Sierra Red	Midden
2032 8:3	2.32	1.70	0.85	3.76	Sierra Red	Midden
2032 8:3	1.86	1.44	0.56	1.63	Sierra Red	Midden
2032 9:3	1.81	1.30	0.84	2.75	Sierra Red	Midden
2032 ?	1.96	1.29	0.71	2.30	Tinaja Red	Midden
2032 ?	1.93	1.67	0.89	3.43	Sierra Red	Midden
2032 ?	2.00	1.79	0.58	2.59	Sierra Red	Midden
2032 ?	1.72	1.29	0.76	2.20	Sierra Red	Midden
2032 ?	2.09	1.44	0.74	2.77	Sierra Red	Midden
2032 ?	1.63	1.61	0.67	2.27	Society Hall	Midden

Table 5.14. Notched Ceramic Sherds: End Notched Medium

Prov.	L	W	Th	Wt	Ceramic Type	Context	Comments
Late Preclassic							
2003 12?	3.70	2.88	0.94	13.53	Eroded	Intrusion Pit	
2003 12:?	3.70	2.88	0.94	13.53	Eroded	Intrusion Pit	
2031 2:23	3.22	3.06	4.06	6.33	Sierra Red	Secondary Deposit	
2031 2:23	3.10	2.00	0.69	6.67	Polvero Black	Secondary Deposit	
2031 3:25	4.58	4.00	0.66	16.20	Preclassic Red	Midden	
2031 5:121	4.10	3.80	1.40	26.00	Society Hall	Midden	

Table 5.14. Notched Ceramic Sherds: End Notched Medium (continued)

Prov.	L	W	Th	Wt	Ceramic Type	Context	Comments
Early Postclassic							
2010 1:7	3.50	2.30	1.00	10.00	Unslipped buff	Midden	
2010 1:7	3.38	2.25	1.28	10.20		Midden	
2010 1:7	3.20	2.40	0.80	8.10	Unslipped orange	Midden	
2010 1:7	4.00	3.30	0.70	11.10		Midden	
2010 1:7	3.61	3.55	1.09	18.81	Eroded	Midden	
Middle Postclassic							
2001 5:2	3.19	2.17	0.66	7.10	Eroded	Rubble	
2001 1:3	3.48	2.32	0.79	8.20	Eroded	Rubble	
2001 12:4	3.43	2.42	0.77	8.50	Eroded	Rubble	
2010 1:1	3.10	3.00	0.70	6.90	Unslipped gray	Midden	
2010 1:1	3.06	2.68	0.64	6.70		Midden	
2010 1:3	3.30	2.30	0.80	0.69	Unslipped buff	Midden	
2010 1:3	3.90	2.40	0.50	6.20	Unslipped yellow	Midden	
2010 1:3	3.50	3.10	1.10	12.00	Red Slip	Midden	
2010 1:3	3.20	3.00	1.10	11.90	Orange Slip	Midden	
2010 1:3	3.50	2.30	0.80	7.90	Orange Slip	Midden	Evidence of notch wear
2010 1:3	3.14	2.20	0.81	6.80		Midden	
2010 1:3	3.17	2.94	1.12	10.90		Midden	
2010 1:3	3.30	2.30	0.80	0.69		Midden	
2010 1:3	3.77	2.33	0.57	6.10		Midden	
2010 1:4	3.47	2.39	1.06	12.60		Midden	
2010 1:4	3.10	2.30	0.90	6.80	Orange Slip	Midden	
2010 1:4	4.60	2.70	1.10	13.90	Orange Slip Rim	Midden	
2010 1:4	4.30	2.68	1.00	13.80		Midden	
2010 1:4	3.50	2.40	1.10	12.60	Orange Slip	Midden	
2010 1:5	3.30	2.70	0.80	8.80	Orange Slip Rim	Midden	Slip appears only along the axis of the notches

Table 5.14. Notched Ceramic Sherds: End Notched Medium (continued)

Prov.	L	W	Th	Wt	Ceramic Type	Context	Comments
2010 1:5	3.60	3.10	8.00	0.40	Orange Slip	Midden	Triangular shape; deep grooves in notches; notch wear present
2010 1:5	3.60	3.20	0.80	11.20	Unslipped buff	Midden	
2010 1:5	3.01	2.72	0.80	8.80		Midden	
2010 1:5	3.52	3.08	0.68	7.80		Midden	
2010 1:6	3.30	2.40	0.73	8.60		Midden	
2010 1:6	3.41	2.12	0.68	7.70		Midden	
2010 1:6	3.60	2.50	0.70	7.00	Unslipped buff	Midden	One side has 3 notch attempts
2010 1:6	3.80	2.30	0.90	11.00	Unslipped buff	Midden	Incised line; ground edges
2010 1:6	3.50	2.30	0.80	7.50	Orange slip	Midden	Notch wear
2010 1:6	3.58	2.15	0.67	7.00	Orange slip	Midden	
2010 1:6	3.71	2.24	0.88	1.80		Midden	Incised line; ground edges
2010 1:6	4.05	3.18	0.70	10.80		Midden	
2032 4:1	3.22	2.41	0.57	5.71	Eroded	Midden	
2032 5:1	3.71	2.64	0.67	7.79	Eroded	Midden	
2032 5:2	4.87	2.75	1.09	14.18	Eroded	Midden	
2032 5:2	4.36	2.85	0.83	13.57	Eroded	Midden	
2032 5:2	3.19	1.35	0.73	4.34	Tinaja Red	Midden	
2032 8:1	3.47	2.08	0.56	4.20	Payil Red	Midden	
Postclassic							
2032 1:5	3.33	2.20	1.09	10.48	Joventud Red	Midden	
2032 8:3	3.86	2.65	0.79	10.60	Sierra Red	Midden	
Unknown							
?	3.20	0.28	0.89	9.79	Eroded	Unknown	
Surface	3.35	2.15	0.58	4.70	Eroded	Unknown	
Surface	3.11	2.50	1.07	10.06	Eroded	Disturbed Surface	

Table 5.15. Notched Ceramic Sherds: End Notched Large

Prov.	L	W	Th	Wt	Ceramic Type	Context	Comments
Late Preclassic							
2031 2:19	5.29	3.92	1.71	28.53	Society Hall	Midden	Partial girdling
Postclassic							
TL1 7:2	6.63	4.68	0.86	41.73	Eroded	Unknown	

Table 5.16. Notched Ceramic Sherds: End Notched Fragments

Prov.	L	W	Th	Wt	Ceramic Type	Context	Comments
Early Postclassic							
2010 1:7	2.40	2.40	0.60	5.00	Orange Slip	Midden	Fragment
2010 1:7	1.30	2.30	0.60	2.30	Orange Slip	Midden	Fragment; incised line
Middle Postclassic							
2010 1:5	2.40	1.40	0.90	4.50	Orange Slip	Midden	Fragment
2010 1:5	2.30	1.90	0.60	3.60	Orange Slip	Midden	Fragment
2032 5:2	1.42	1.84	0.68	1.39	Eroded	Midden	Fragment
2032 8:1	3.47	2.08	0.56	4.20	Payil Red	Midden	Fragment; one edge missing

Notched and Girdled Ceramic Sherds

A total of four notched and girdled ceramic sherds were recovered from midden contexts at Colha. The notched sherd subform was first recognized in the reworked ceramic sherd assemblage at Cerros (Garber 1987; 1988). Notched and girdled sherds are produced from rim sherds and display an encircling groove that runs along the notch axis (i.e. notch to notch). The four Colha notched and girdled sherds display notching along the short axis, which would classify them as side notched (Table 5.17). This is in keeping with the notched and girdled sherd collection from Cerros.

Garber (1989) suggests that this form may have functioned as a net or line weight with the encircling groove enabling a better hold of the fishing line. Garber further states that this subform may have been multi-functional. Whatever function ascribed, it is most probable that rim sherds were selected for their added weight.

Table 5.17. Notched Ceramic Sherds: Notched and Girdled

Prov.	L	W	Th	Wt	Ceramic Type	Context	Comments
Protoclassic							
2031 6:106	6.60	3.60	3.62	0.52	Society Hall	Midden	Rim Sherd
Middle Postclassic							
2010 1:6	3.50	2.60	0.70	8.10	Orange slip	Midden	Rim sherd
2010 1:6	3.40	3.20	0.80	11.50	Unslipped buff	Midden	Rim sherd
Postclassic							
2032 9:5	3.09	2.89	1.57	17.18	Eroded Rim Sherd	Midden	Rim sherd

Ceramic Sherd Disks

This form category is comprised ceramic sherds that have been reworked though production techniques of breaking, flaking, cutting, and grinding into circular, or discoid forms. Within this form category are two subforms, unperforated disks and perforated disks (Figure 5.8). This category is comprised of 49 specimens (Buttles 1992a; Gillis 1982; McGregor 1994; Valdez and Gillis 1980). Following Willey (1972) and Garber (1981, 1989) two arbitrary categories of small and large, corresponding to disk diameter, have been established. This dissertation considers an additional category of disk fragments. Small disks are those specimens with diameters no greater than 5.0 cm and large disks 5.0 cm and greater. The average diameter of the Colha sherd disk assemblage is 4.47 cm (standard deviation .61 cm). The small disk average diameter is of 3.75 cm (standard deviation .61 cm), whereas the large category average diameter is 6.85 cm (standard deviation 1.78 cm).

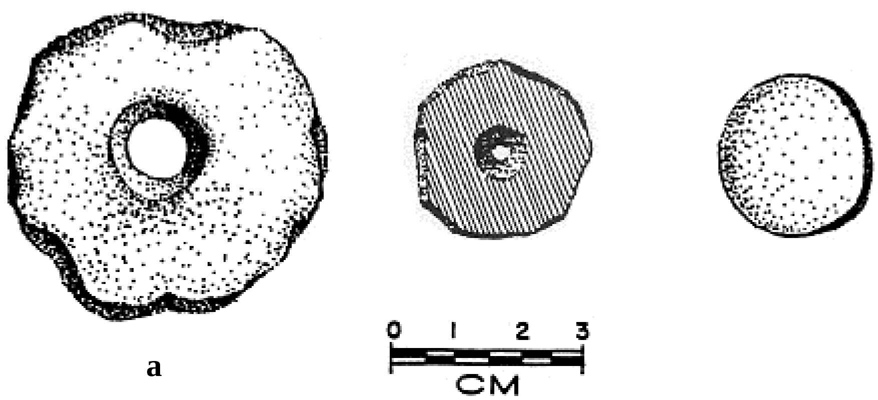


Figure 5.8. Ceramic Sherd Disks: a-b) perforated, c-d) unperforated

Ceramic Sherd Disks: Unperforated

The subform of unperforated disks is represented by 38 specimens recovered from midden (n=13), construction related (n=10), burial (n=8), unknown (n=6), and lithic workshop (n=1) contexts at Colha (Figure 5.8.c; Tables 5.18, 5.19, and 5.20). Data on 12 specimens was obtained from Gillis (1981) and are denoted by an asterisk*. Reworked ceramic sherd disk are reported throughout the Maya area (Coe 1959, 1961, 1965a; Garber 1981, 1989; Graham 1994; Kidder, Jennings, and Shook 1946; Lee 1969; Longyear 1952; Thompson 1939; Willey 1972, 1978; Willey et al. 1994; Valdez and Buttles 1995). Functional assignments of this artifact type have been linked to size. It has been suggested that the larger disks may have served as blanks for perforated disks; lids for narrow-mouthed vessels; and stoppers for beehives (Buttles 1992a; Garber 1981, 1989; Gillis 1982; Hammond 1991a; Lee 1969; McGregor 1985; Valdez and Gillis 1979). Suggested functions of the smaller varieties include gaming pieces, tokens, money, counters, and blanks for perforated disks (Garber 1981, 1989; Lee 1969; Willey 1972).

Possible game boards are reported from Benque Viejo, Chiapa de Corzo, Chicanna, Chichen Itza, Dzibilchaltun, El Cayo, El Tajin, Palenque, Piedras Negras, Stann Creek, Tikal, and Uaxactun (Eaton 1991, personal communication; Trick and Kampen 1983; Weaver 1993:399). It is possible that the smaller disks may have served as gaming pieces for such boards.

Two unperforated disks are reported from an early Middle Preclassic primary midden containing burials and seven from three Late Preclassic burials. Willey (1972) reports disks from burial contexts at Altar de Sacrificios. Their inclusion in burials may be as part of composite artifacts.

Ceramic sherd disks may have also functioned as lids for perishable containers. An unperforated disk functioning as a vessel lid for a Late Postclassic censor (SF-664) was recovered *in situ* at Cerros (Garber 1989:76). Unperforated sherd disks are also reported from ritual contexts at Cerros (Garber 1989:73) and Altar de Sacrificios (Willey 1972:64). The context of the Colha disks does not indicate ritual use. With the exception of the ritual deposits, the contextual distribution of the unperforated sherd disks is similar to those reported from Altar de Sacrificios (Willey 1972), Cerros (Garber 1989), and Cerros (Hammond 1991a).

Table 5.18. Ceramic Sherd Disks: Unperforated Small

Prov.	D	Th	Wt	Ceramic Type	Context	Comments
early Middle Preclassic						
2031 3:38A	3.30	0.70	5.40	Consejo Red and Cream	Primary midden containing burials	
2031 3:38A	3.70	0.70	10.50	Consejo Red and Cream	Primary midden containing burials	
2031 5:224	4.50	0.70	14.00	Unslipped orange	Construction fill	
late Middle Preclassic						
2031 6:198	4.70	0.77	19.00	Towerhill Red on Cream	Midden	

Table 5.18. Ceramic Sherd Disks: Unperforated Small (continued)

Prov.	D	Th	Wt	Ceramic Type	Context	Comments
Late Preclassic						
2012 B3*	4.10	0.30	6.60		Burial	
2012 B3*	3.90	0.60	6.10		Burial	
2012 F16*	3.50	0.40	7.10		Burial	Crypt for B3
2012 F16*	4.30	0.90	23.4		Burial	Crypt for B3
2031 5:118	3.50	0.79	0.90	Unslipped buff	Mass burial feature	
2031 5:121	4.80	0.64	10.00	Unslipped buff	Primary midden	
2031 6:131	3.70	0.50	8.70	Sierra Red	Midden fill	
2031 7:173	4.60	0.77	19.00	Joventud Red	Rubble and midden	
2031 7:95	4.20	0.77	17.00	Sapote Striated	Burial	Burnt
Protoclassic						
2003 22:8W*	1.80	0.62	2.30		Wall clean-up	
2003 22:8W*	1.70	0.63	1.90		Wall clean-up	
2031 6:81	3.80	0.60	6.00	Sierra Red	Floor and rubble fill	
2031 6:81	3.80	0.45	9.00	Joventud Red	Floor and rubble fill	
2031 6:84	3.30	0.78	11.00	Sierra Red	Midden	
2031 6:81	3.80	0.60	6.00	Sierra Red	Floor and rubble fill	
2031 7:84	4.20	0.72	13.00	San Felipe Brown	Midden	
Late Classic						
2012 5:6*	5.50	0.40	18.6		Construction fill	
Middle Postclassic						
2001 1:1*	2.60	0.47	7.80		Midden	
2001 11:2*	3.10	0.79	7.90		Midden	
2032 10:2	2.89	1.26	11.99	Payil Red	Midden	Irregular unground edges
Postclassic						
2003 15:2*	4.50	0.93	20.00		Midden	

Table 5.18. Ceramic Sherd Disks: Unperforated Small (continued)

Prov.	D	Th	Wt	Ceramic Type	Context	Comments
Unknown						
2007*	2.3	.77	5.9	Unslipped	Unknown	
2035 2:3	3.27	0.47	5.99	Brown slip	Unknown	Irregular edges

Table 5.19. Ceramic Sherd Disks: Unperforated Large

Prov.	D	Th	Wt	Ceramic Type	Context	Comments
late Middle Preclassic						
2031 6:198	4.70	0.77	19.00	Towerhill Red on Cream	Midden	
Late Preclassic						
2024 11:2*	6.5	.7	42.7		Lithic workshop	
2012 5:B3	11.00	0.50	53.00	Sapote Striated	Burial	Fragment, partially burnt
2031 7:109	5.40	0.81	25.00	Sierra Red	Floor	
Protoclassic						
2031 6:83	5.80	0.61	15.00	Unslipped orange	Solid marl layer	
2031 7:81	6.00	0.66	30.00	Sierra Red	Floor and rubble fill	Fragment
Postclassic						
2003 1:1*	5.0	.75	25.7		Surface	
Unknown						
?	6.39	7.71	38.45	Eroded	Unknown	Irregular unground edges

Table 5.20. Ceramic Sherd Disks: Unperforated Fragments

Prov.	D	Th	Wt	Ceramic Type	Context	Comments
Late Preclassic						
2012 5:B3	11.00	0.50	53.00	Sapote Striated	Burial	Fragment and partially burnt
Protoclassic						
2031 6:83	5.80	0.61	15.00	Unslipped orange	Solid marl layer	Fragment
2031 7:81	6.00	0.66	30.00	Sierra Red	Floor and rubble fill	Fragment

Ceramic Sherd Disks: Perforated

Within the ceramic sherd disk form group are 25 examples of the perforated sherd disks subform. The specimens were recovered from midden (n=17), construction related (n=2), and unknown (n=6) contexts (Figure 5.8.c; Tables 5.21, 5.22, and 5.23). Ceramic sherd disks with centrally located perforations represent this subform. Only six specimens were available for this analysis therefore all other data is taken from Stock (1980:241). The Stock analyzed specimens are denoted by an asterisk*. Production techniques are identical to those used for the manufacture of sherd disks with the addition of drilling. As with the ceramic sherd disks, arbitrary size categories of small and large corresponding to diameter have been established.

Table 5.21. Ceramic Sherd Disks: Perforated Small

Prov.	D	Th	Wt	Ceramic Type	Context	Comments
Middle Postclassic						
2001 5:2*	4.20	0.57	9.70	Orange slip	Midden	
2001 11:2*	3.90	5.80	8.80	Brown slip	Midden	
2001 11:2*	3.40	5.60	6.60	Unslipped Brown	Midden	
2001 11:4	2.90	0.65	5.70	Orange slip	Midden	
2010 1:?	3.00	0.66	7.30		Midden	
2010 1:3	2.90	0.78	6.20		Midden	
2032 7:2	2.58	0.72	5.30	Payil Red	Midden	
2032 8:1	2.34	0.54	3.04	Payil Red	Midden	
2032 8:2	1.92	0.48	1.72	Payil Red	Midden	
2032 9:2	2.88	0.42	4.10	Payil Red	Midden	
Postclassic						
2003 15:2	4.20	1.00	19.0	Unslipped	Midden	Edges ground
Unknown						
?	3.90	0.70	10.5	Orange slip	Unknown	
Surface*	2.80	0.99	7.60		Unknown	
2007 7:1*	3.30	0.54	5.90	Orange slip	Unknown	Edges ground

Table 5.22. Ceramic Sherd Disks: Perforated Large

Prov.	D	Th	Wt	Ceramic Type	Context
Late Preclassic					
2002 23:2	5.20	1.50	30.10	Unslipped Black	Unknown
Protoclassic					
2031 5/106	6.02	0.84	21.32	Polvero Black	Midden
Early Postclassic					
2032 8:3*	6.75	0.88	30.52	Eroded	Midden
Middle Postclassic					
2001 11:1*	5.70	0.70	22.40		Midden
2001 11:1*	6.60				Midden

Table 5.23. Ceramic Sherd Disks: Fragments

Prov.	D	Th	Wt	Ceramic Type	Context
Late Classic					
2025 2:3	3.50	0.40	4.77		Construction fill
2025 8:2	4.50	0.80	15.30		Construction fill
Terminal Classic					
2012 7:2	4.70	0.40	6.80		Unknown
Middle Postclassic					
2001 11:1	6.60		23.1	Unslipped Orange	Midden
2010 1:3	4.60	0.89	13.2	Light Brown slip	Midden
Unknown					
?	4.20	0.30	3.90		Unknown

This ceramic sherd disk subform occurs through the Maya area in contexts ranging from Preclassic to Postclassic (cf. Buttles 1991a, 1992; Coe 1959, 1961, 1965a; Delgado 1965; Garber 1981, 1989; Gillis 1982; Graham 1994; Hammond 1991a; Kidder 1947; Kidder et al. 1946; Lee 1969; Longyear 1952; McGregor 1985; Ricketson and Ricketson 1937; Valdez and Gillis 1980; Willey 1994). The function most commonly attributed to perforated sherd disks is that of an ad hoc spindle whorl. When spinning thread, the whorl is placed on a wooden spindle serving as a flywheel. Although some of the perforated disks may have been used as spindle whorls it is also quite possible that spindle whorls during the Preclassic were manufactured from materials such as wood and or wax. In such a case, these specimens would rarely be recovered due to decomposition. However, a wooden spindle is reported from a cave on the eastern side of the Cerro Delgado (Grove 1987:Fig. 16.27a).

Based upon experimentation, Kent (1957) believes that only carefully shaped perforated sherd disks may have functioned as spindle whorls. According to Coe (1961) some of the cruder specimens may have served as decorative elements. Coe (1959) also states that the disks may have functioned as a hand-held distaff as used with a bow drill, it is possible that a perforation would eventually occur after long-term use. Hammond (1991a) notes that the larger perforated disks may have functioned as beehive doors. Perforated limestone disks have also been ascribed this function.

Sheets (1978:67) suggests that perforated disks may have functioned as jar lids, with a cord knotted on either side of the perforation for easy placement or removal. This may be especially true for specimens exhibiting carefully ground edges. It is also possible that unperforated disks may have been intended for this function. If the intended function was as a vessel lid, specimens of both the unperforated and perforated forms may have been roughly shaped disks, and then shaped or smoothed to fit the vessel or gourd it was intended for. It is clear that the function of this artifact class is quite problematic.

Ceramic Sherd Pendants

This subform category is comprised of one early Middle Preclassic specimen, recovered from a midden context, exhibiting a single perforation and smooth edges (Table 5.24). This specimen was produced through techniques of cutting, flaking, and grinding. The function most commonly attributed to this subform is that of pendant (Buttles 1992a; Garber 1981, 1989; Gillis 1982; Lee 1969; McGregor 1985; Willey 1978; Valdez and Gillis 1980).

Table 5.24. Ceramic Sherd Pendants

Prov.	L	W	Th	Wt	Ceramic Type	Context
early Middle Preclassic						
2031 3:38A	3.70	4.40	0.91	0.74	Joventud Buff	Midden

This early Middle Preclassic specimen is oval in form with an oval bulb extending from the top of the specimen (McGregor 1985). It is at the oval bulb that a biconical perforation is found. The pendant was recovered from an early Middle Preclassic midden containing burials (Anthony and Black 1994). It is possible that the pendant may have been associated with one of the burials.

Miscellaneous Reworked Ceramic Sherds

Included in this category are the reworked ceramic sherds that do not conform to any previously established functional/form types or that are unique within the Colha collection. This category is comprised of two subforms corresponding to morphology, rectangular and triangular (Tables 5.25 and 5.26). The one consistent attribute is that the edges of the specimens have been ground smooth.

The function of these specimens may have been as gaming pieces, trinkets, or possibly unfinished pendants as suggested by Garber (1989). Another possible function is that of ceramic production tool. Modern day potters use similarly shaped ceramic sherds as smoothing implements during the manufacturing process of ceramic vessels (Valdez, personal communication 2002).

Miscellaneous Reworked Ceramic Sherds: Rectangular

This subform category is comprised of three Preclassic specimens that are rectangular in form (Table 5.25). Each is reported from similar contexts; midden associated with a household. Similar rectangular specimens are reported from Cerros from midden and construction fill contexts (Garber 1989).

Table 5.25. Miscellaneous Reworked Ceramic Sherds: Rectangular

Prov.	**L**	**W**	**Th**	**Wt**	**Ceramic Type**	**Context**	**Comments**
late Middle Preclassic							
2031 7:138	3.70	4.40	0.91	0.74	Joventud Buff	Midden	Smooth edges
2031 6:198	4.20	2.90	0.70	8.10	Ramgoat Red	Midden	Smooth edges
Late Preclassic							
2031 5:171	5.62	4.10	1.00	22.20	Sierra Red	Midden	Smooth edges

Miscellaneous Reworked Ceramic Sherds: Triangular

One specimen comprises this category (Table 5.26). It is a Postclassic example that was recovered from the surface lot of Op 2001 (Shafer 1979). A series of post-firing incised lines in the form of cross-hatching are present on what would have been the interior of the vessel. No perforations are noted. Review of the archaeological literature revealed no similar specimens.

Table 5.26. Miscellaneous Reworked Ceramic Sherds: Triangular

Prov.	L	W	Th	Wt	Ceramic Type	Context	Comments
Middle Postclassic							
2001 1:1	3.78	2.91	0.65	6.52	Payil Red	Surface	Cross-hatching on surface

CONTEXTUAL PATTERNS AND TRENDS

Within the select portable material culture assemblage of Colha, two technological production strategies for artifacts derived from clay are represented, modeled clay and reworked ceramic sherds. Contextual patterns and trends for each technological production strategy are presented below.

Modeled Clay

A total of 55 modeled clay artifacts were recovered from excavations at Colha. Of these only two are reported from Preclassic context and two from Classic contexts (Table 5.27). The majority, n=52 or 94.5%, were derived from

Postclassic deposits. Of the Postclassic specimens 76.3% were recovered from midden deposits (Table 5.28). The Preclassic specimens are represented by one bead from a ceramic cache deposit at Op 2012 and an ocarina from a Protoclassic burial.

Table 5.27 Temporal Distribution of Modeled Clay Artifacts

Artifacts		**Temporal Data**							
Form	**Subform**	**eMPC**	**lMPC**	**LPC**	**PRC**	**LC**	**EPC**	**MPC**	**PC**
Beads		1						2	
Figurines									
	Hollow							1	1
	Solid							1	
Winded Instruments									
	Whistles							1	
	Ocarinas				1	1			1
Spindle Whorls							6	9	10
Stamps									
	Cylindrical								1
	Flat								1
Notched Pellets								7	11
TOTAL		**1**	**0**	**0**	**1**	**1**	**6**	**21**	**25**

The small representation of Preclassic modeled artifacts is in keeping with the site of Cerros (Garber 1989). However, the sites of Altar de Sacrificios (Willey 1972) and Cuello (Hammond 1991a) report a much greater amount and diversity than Colha or Cerros. Overall, the relatively low frequency of many of the artifact forms represented does not allow for the development of contextual trends or pattern. Under the various form and subform categories, contextual patterns that were noted from other sites are provided.

Table 5.28. Contextual Distribution of Modeled Clay Artifacts

Artifact		Contextual Data				
Form	**Subform**	**Burial**	**Cache**	**Midden**	**Construction fill**	**Unknown**
Beads			1	2		
Figurines						
	Hollow			1		1
	Solid			1		
Winded Instruments						
	Whistles			1		
	Ocarinas	1		1		1
Spindle Whorls				25		
Stamps						
	Cylindrical			1		
	Flat			1		
Notched Pellets				9	9	
TOTAL		**1**	**1**	**42**	**9**	**2**

Spindle whorls are the most prevalent molded clay artifact form at Colha followed by notched pellets. However, if the notched pellets represent rattles from vessel feet rather than net weights their numbers as “weights” would decrease (Valdez and Gillis 1980). The most under represented form at Colha is that of figurines.

The size and contextual distribution of the Colha modeled clay artifact assemblage is similar to that reported from Cerros (Garber 1989) and Cuello (Hammond 1991a). Larger sites such as Copan (Willey et al. 1994) and Seibal (Willey 1978) report a greater diversity of modeled and molded clay artifacts.

Reworked Ceramic Sherds

Within the Colha portable material culture assemblage is found 242 artifacts manufactured from ceramic sherds. Two major form categories dominate the collection, notched sherds and sherd disks. Temporal distribution and contextual patterns were noted for these two form types (Table 5.29 and 5.30). The number of artifacts represented by the pendant and miscellaneous forms are too small to establish any contextual patterns.

The majority of reworked ceramic sherds, n=148 or 61.1%, are reported from Postclassic midden contexts (Table 5.30). Unlike the modeled clay artifacts, the reworked sherds do appear in some frequency, n=76 or 31.4%, during the Preclassic. The Late Classic (n=6 or 3.4%) and Terminal Classic (n=1 or 0.57%) are highly under represented and account for only seven ceramic sherd artifacts.

Table 5.29. Temporal Distribution of Reworked Ceramic Sherd Artifacts

Artifacts		Temporal Data									
Form	**Subform**	**eMPC**	**lMPC**	**LPC**	**PRC**	**LC**	**TC**	**EPC**	**MPC**	**PC**	**Unknown**
Notched Sherds											
	Side	9	4	9	7	3		2	7		1
	End			11				14	85	15	3
	Notched and Girdled				1				2	1	
Sherd Disks											
	Unperforated	3	2	13	11	1			3	2	3
	Perforated			1	1	2	1	1	14	1	4
Pendants		1									
Misc.											
	Rectangular		2	1							
	Triangular								1		
TOTAL		**13**	**8**	**35**	**20**	**6**	**1**	**17**	**112**	**19**	**11**

Notched sherds account for n=174 or 71.9% of the reworked ceramic sherd assemblage. Notched sherds first appear at Colha during the early Middle Preclassic and continue into the Postclassic. As previously discussed the side notched form occurs most frequently as a single occurrence whereas the end notch subform is found in groups. The size, weight, and contextual distribution of the side notched sherd suggest that it functioned as line weights and the end notched sherd as a net weight.

Table 5.30 Contextual Distribution of Reworked Ceramic Sherds

Artifact		Contextual Data							
Form	**Subform**	**Burial**	**Cache**	**Midden**	**Construction Material**	**Intrusion Pit**	**Possible Mold**	**Lithic Workshop**	**Unknown**
Notched Sherds									
	Side		1	17	18	1	1		4
	End			113	5				10
	Notched and Girdled			4					
Sherd Disks									
	Unperforated	8		13	10			1	6
	Perforated			17	2				6
Pendants				1					
Misc.									
	Rectangular			3					
	Triangular								1
TOTAL		**8**	**1**	**168**	**35**	**1**	**1**	**1**	**27**

Differential distribution of the two notched sherd subforms is noted at Colha. The side notched form dominates during the Preclassic and accounts for 69.0% of that assemblage. By the Postclassic, the end notched form has all but replaced the side notched form and accounts for 89.0% of the assemblage. Only two notched sherds are attributed to the Classic period.

The second largest ceramic artifact form category is the disk (n=62). The majority (n=29 or 46.0%) of unperforated disks are reported from Preclassic contexts. The unperforated subform also dominates at the sites of Altar de Sacrificios (Willey 1972), Cerros (Garber 1989), and Cuello (Hammond 1991a).

During the Preclassic, eight unperforated disks were associated with burials. The majority however, are reported from midden and construction related deposits. By the Postclassic the perforated subform prevails (n=16 or 25.8%). The entire Postclassic unperforated and perforated assemblage is reported from midden deposits.

Seven (of 25), specimens of the perforated subform are reported from midden context; the context of the remaining 18 specimens is unknown. The perforated sherd disk is commonly referred to as an ad hoc spindle whorl. No contextual evidence is reported from Colha to suggest such a function. Although it is possible that this artifact form functioned as a spindle whorl, such a functional designation could be classified as problematic.

CHAPTER 6

RAW MATERIAL: SHELL

EXTENSIVELY MODIFIED SHELL AND

WHOLE MODIFIED SHELL ARTIFACTS

Shell as a raw material at Colha is represented by both freshwater and marine species (Buttles 1992a; Dreiss 1982, 1994; Feldman 1994; Stock 1979). It has been documented that the ancient Maya diet included both marine and freshwater resources (Shaw 1991a; McKillop 1984). A by-product of both of these subsistence strategies includes in many cases shell. The ancient Maya became adept at taking this resource and turning it into items that represent both practical and prestige technologies.

Depictions of individuals wearing shell artifacts similar to forms recovered from Colha are seen at Caracol, Stela 6 (Beetz and Satterthwaite 1981); Copan, Stelae A and B (Kidder, Jennings, and Shook 1946); Mundo Perdido, a cylindrical vessel (Harrison 1999:136; La Porte 2000: Figures 36), Quiriqua, Stela F (Sharer 1990); Siebal, Stela 10 (Graham 1990); Tikal, Lintel 2, temple III (Coe et al. 1981); Tikal, Stela 21 (Harrison 1999), Yaxchilan Lintels 24, 26, and 44 (Graham 1979) and Xunantunich, Stela 8 (Graham 1978:124). It is also important to note that shells are thought to hold ideological significance and are often associated with water and representative of the primordial ocean (Schele and Miller 1986).

Evidence suggests that marine shell was being traded into inland sites as a raw commodity (Cobos 1991; Hammond 1975; Hohmann 2002). However, it is quite probable that trade in finished or partially finished shell products was occurring simultaneously. Shell artifact manufacturing locales utilizing whole shell have been identified at Cahal Pech (Lee and Awe 1995; Lee 1996), Caracol (Cobos 1991, 1994), and Pacbitun (Hohmann 2002; Hohmann and Powis 1996, 1999).

The presence of conch columellas, lips, and spines at Colha indicate that whole conch shells were being brought into the site and worked (see Dreiss 1994). Additional species of whole shell are also reported from burial and cache contexts (Buttles 1992a; Dreiss 1994; Feldman 1994). Further evidence of manufacture at Colha is found in bead blanks and the recovery of beads in varying stages of manufacture (Buttles 1992a; Potter 1980). However, missing from Colha is the large percentage of shell detritus that is present at the manufacturing locales at Cahal Pech, Caracol, and Pacbitun. It is possible that production loci have not been identified at Colha or in the case of disk beads, the beads may have been traded into the site as blanks similar to those described from Pacbitun and production was conducted at a cottage level (Hohmann 2002; Potter et al n.d.).

A variety of shell species are represented in the Colha collection (cf. Dreiss 1994). The majority of shell artifacts were produced from marine species such as *Spondylus, Strombus, Marginella, Dentalium, Oliva, and Olivella*. Freshwater species such as *Nephronaias calamitarium* were also utilized and were probably acquired from water sources near Colha. The majority of marine species utilized are native to the Caribbean Ocean. Evidence of long-distance trade at Colha is found in the occurrence of Pacific Ocean marine species.

Modified shell is identified as any type of shell that has undergone some type of human modification. Modified shell (n=1,519) accounts for the majority of portable material culture recovered from Colha (Buttles 1992a; Dreiss 1982, 1994; Stock 1979). Two categories of modified shell are present in the Colha collection based upon the extent of modification. The first includes shell artifacts that through extensive modification have been altered beyond their original shell form. The second is comprised of shell artifacts that although altered maintain the majority of their original shell form.

Several manufacturing techniques were probably utilized including indirect or direct percussion, cutting, sawing, flaking, grinding, and perforation (see Suárez 1974, 1991). The techniques applied probably reflect the envisioned end product. The subtractive nature of the manufacturing process provides for slight variations within form and subform categories.

EXTENSIVELY MODIFIED SHELL ARTIFACTS

This class of artifacts is comprised of 1,342 shell artifacts that no longer retain any part of their original form. The shell artifact categories include beads, disks, rings, labrets, pendants, and miscellaneous carved shell. Within several of the form categories, subforms are found. This category of shell accounts for the majority of shell artifacts from most of the inland sites in the Maya area.

Shell Beads

The form category of shell beads is comprised of four subforms disk beads, disk bead blanks, tubular beads, and whole perforated shell beads. The majority of beads are of the disk subform. Specific functions of the individual bead subforms are suggested based on context.

Shell Beads: Disks

The disk bead subform is the most prevalent (n=1,283) subform of shell beads at Colha (Figure 6.1; Table 6.1). The beads are reported from burial (n=1,134), cache (n=121), midden (n=18), ceramic lined fire pit (n=4), and unknown (n=6) contexts (Table 6.4). Due to the large quantity of beads, measurements are provided as averages with standard deviations. This artifact form and its contexts are predominately Preclassic and in particular a Middle Preclassic phenomenon. The disk bead subform also dominates the Preclassic modified shell collections at Cahal Pech (Awe 1002) Caracol (Brown, personal communication 2002), Cerros (Garber 1989), Chiapa de Corzo (Lee 1969: Figure 131, 132), Cuello (Hammond 1991a; Hammond et al. 1992) and K'axob (Isaza Aizpurúa 1997; Isaza Aizpurúa and McAnany 1999).

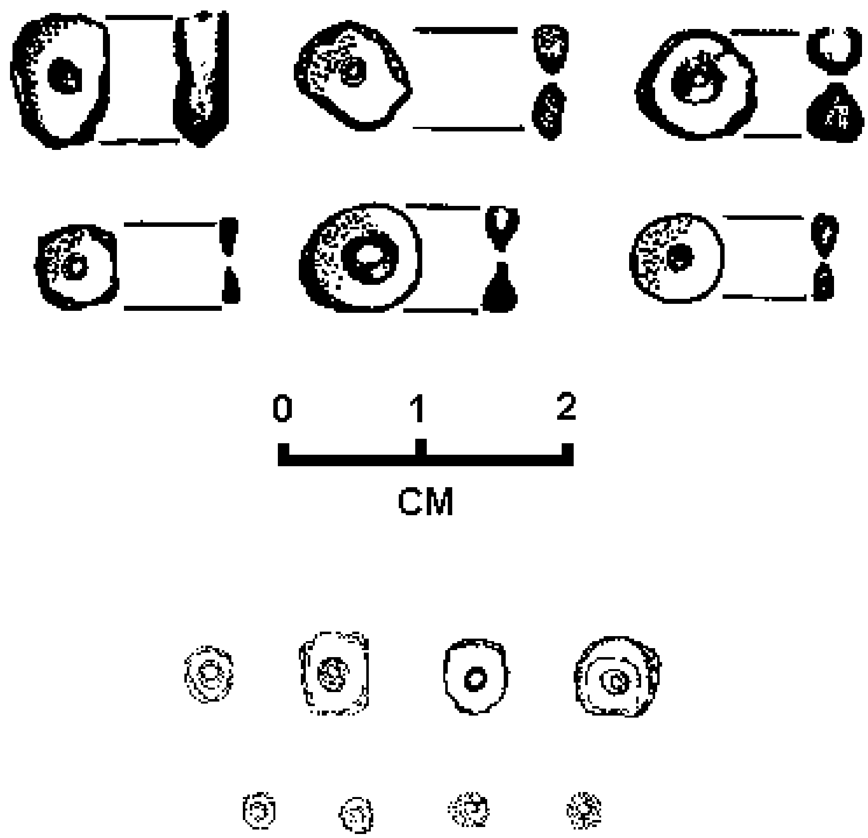


Figure 6.1. Middle Preclassic Disk Shell Beads (after Dreiss 1982; Buttles 1992a)

Similar disk shell beads from Preclassic contexts are reported from Altun Ha (Pendergast 1979), El Mirador (Howell and Copeland 1989, Fig. 56) Dos Hombres (Buttles n.d.), and Nakbe (Hanson, personal communication 2000). A large quantity of disk shell beads are reported from an Early Classic deposit at Nebaj (Smith and Kidder 1951:Figure 69b).

Table 6.1. Averages and Standard Deviations of Category I and II Shell Disk Beads

Number of Specimens	Average Diameter	Standard Deviation	Average Thickness	Standard Deviation
Early Middle Preclassic				
425	8.06	2.97	2.66	1.36
Late Middle Preclassic				
724	10.13	1.73	3.07	1.27
Late Preclassic				
118	4.73	0.61	2.31	0.70
Protoclassic				
14	5.70	1.24	2.95	1.17

The disk bead subform at Colha is described as being generally discoidal in shape with a central biconical or uniconical perforation (see Figure 6.1). However, a few specimens may be more oval or squared. The morphological differences are probably a result of the subtractive nature of their production and the final form necessitated. After examining the disk bead collection it was evident that two types corresponding to edge finishing are present in the Colha collection. The first category (I) (Table 6.2) is comprised of 384 disk beads with ground and smoothed edges. The majority of these are manufactured from Gastropods body whorls and shoulders. Identifiable species represented include *Strombus pugilis*, *Fasciolaria* *tulipa*, and *Spondylous* (Dreiss 1994). The second category (II) (Table 6.3) is comprised 691 beads that are generally discoidal or oval in shape, with a few beads being more squared. The edges are usually uneven and show little to no grinding. The majority of category II beads are also made from Gastropods including body whorls and shoulders. Identified species include *Strombus pugilis*, *Fasciolaria tulipa*, *Spondylous*, and *Nephronaias calamitarum* (Dreiss 1994). Specimens from both categories that were manufactured from Gastropod shoulders commonly exhibit ridges.

Table 6.2. Category I Shell Disk Beads

Number of Specimens	Average Diameter	Standard Deviation	Average Thickness	Standard Deviation
Early Middle Preclassic				
165	4.57	1.92	1.69	0.75
Late Middle Preclassic				
139	4.52	1.29	1.69	0.74
Late Preclassic				
115	4.72	0.61	2.29	0.67
Protoclassic				
16	5.83	1.28	3.16	0.99

Table 6.3. Category II Shell Disk Beads

Number of Specimens	Average Diameter	Standard Deviation	Average Thickness	Standard Deviation
Early Middle Preclassic				
260	9.54	1.90	3.07	1.35
late Middle Preclassic				
585	10.13	1.73	3.07	1.27
Late Preclassic				
3	4.65	0.43	3.27	1.21
Protoclassic				
2	4.82	0.27	1.64	1.84

The repeated contextual pattern of these beads provides direct evidence of their function. The majority of disk beads were recovered from the wrist, ankles, and chests of Preclassic burials (Buttles 1992a; Table 6.4). Analysis of the Preclassic burials has revealed that the shell disks beads are associated with both males and females ranging in age from infant to mid/old adult (Wright n.d.a; Young 1994). The evidence suggests that these beads were used as personal adornments in the form of anklets, arm bands, bracelets, necklaces, and waistlets. Middle Preclassic burials from Altun Ha (Pendergast 1979), Cuello (Hammond 1991a; Hammond et al. 1992), and K'axob (Isaza Aizpurúa 1997; Isaza Aizpurúa and McAnany 1999) have produced the same type of disk shell beads. Disk beads are also associated with a Late Preclassic burial at Uaxactun (Kidder 1947; Ricketson and Ricketson 1937) and Protoclassic burials at Caracol (Brown 2002, personal communication), and Barton Ramie (Willey et al. 1965:509).

Table 6.4. Contextual Distributions of Category I and II Shell Disk Beads

Number of Specimens	Burial	Cache	Midden	Ceramic Lined Fire Pit	Unknown
early Middle Preclassic					
425	303	97	17	4	5
late Middle Preclassic					
724	698	24	1		
Late Preclassic					
118	117				1
Protoclassic					
16	16				
Totals					
	1134	121	18	4	6

Shell Beads: Disk Shell Bead Blanks

This category is comprised of 18 specimens recovered from burial (n=4), post mold (n=12), cache (n=1), and midden (n=1) contexts (Table 6.5). The beads range in form from square to rectangular with the largest being 2.5 cm by 1.50 cm with a thickness of .70 cm and weighing 3.5 g. The smallest bead blank is 1.0 cm. by 1.56 cm with a thickness of .65 cm and weighing .85 g. The bead blank forms are similar to the finished forms recovered from burial and cache deposits.

Table 6.5. Contextual Distribution of Shell Disk Bead Blanks

Number of Specimens	Burial	Cache	Midden	Post Mold
early Middle Preclassic				
14		1	1	12
Late Preclassic				
4	4			

The presence of bead blanks provides evidence although rather limited of shell bead production at Colha. Further support of production is found at Op. 2012 where Potter (1980) reports the recovery of Middle Preclassic disk shell beads in varying stages of manufacture. Associated with this feature also was a burin spall. The burin spall is thought to have functioned as a drill and probably was used to perforated disk shell beads (Pitzer et al. 1974; Potter et al. n.d.; Suarez 1974). A Middle Preclassic burin spall production local at the site of Labpeck which lies approximately five miles west of Colha was discovered by Shafer, Hester, and Potter (Potter et al. n.d.).

Shell Beads: Tubular

Tubular beads are defined as those specimens that have a length greater than their diameter. The tubular shell bead collection at Colha is comprised of seven biconically drilled Protoclassic specimens recovered from burial (n=4) and cache (n=3) contexts (Figure 6.2; Table 6.6). All seven specimens are manufactured from *Spondylus*. Similar Preclassic tubular beads are reported from Caracol (Brown 2002, personal communication), Cerros (Garber 1989), and Chiapa de Corzo (Lee 1969, Figure 133). Sites reporting similar tubular *Spondylus* beads from Classic contexts include Altar de Sacrificios (Willey 1978) and Rancho Ina (López et al. 1996). Garber (1989:64) attributes the low number of tubular beads to manufacturing difficulties.

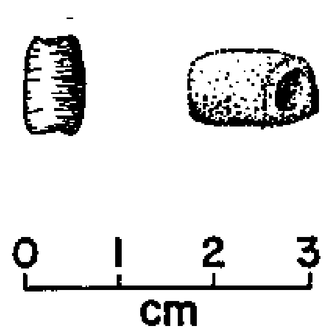


Figure 6.2. Shell Beads: Tubular (Op 2012 5:F15 after Potter 1982:109)

Table 6.6 Shell Beads: Tubular

Prov.	D	L	Wt	Context	Comments
Protoclassic					
2031 5/6:110	1.00	1.10	0.48	Burial, adult female	Recovered from chest
2031 5/6:110	0.65	1.00	0.40	Burial, adult female	Recovered from chest
2031 5/6:110	0.40	0.83	0.16	Burial, adult female	Recovered from chest
2031 5/6:110	0.50	0.55	0.22	Burial, adult female	Recovered from chest
2012 12:55	0.55	1.30	0.30	Cache	
2012 12:55	0.45	1.55	0.30	Cache	
2012 F15	1.17	1.16	1.99	Cache	

Of the seven tubular beads, four were recovered from the chest region of a mid/old adult female (Buttles 1992a; Sullivan 1991a; Wright n.d.a). The beads were part of an elaborate greenstone necklace that accompanied this individual. The remaining three beads were recovered from two cache deposits.

Shell Disks

This category is comprised of 12 examples of shell that through manufacturing techniques of breaking, flaking, carving, incising, and grinding have been shaped into circular or disk form (Table 6.7, Table 6.8, Table 6.9, and Table 6.10). Within this shell disk form are four subforms corresponding to surface treatment including unperforated plain disks, unperforated and decorated disks, perforated plain disks, and perforated decorated disk.

Shell disks have typically been classified as adornos (Garber 1981, 1989; Willey 1972, 1978). The Colha specimens are similar in form to those reported from Altar de Sacrificios (Willey 1972), Altun Ha (Pendergast 1979), Cerros

(Garber 1981, 1989), Dolores (Eaton 1978), K’axob (Isaza Aizpurúa 1999; Isaza Aizpurúa and McAnany 1999), Mundo Perdido (Diaz 1983), Piedras Negras (Coe 1959), Rancho Ina (López et al. 1996), Santa Rita (Sidrys 1983), and Uaxactun (Kidder 1947).   A depiction of a male figure wearing what appears to be a perforated shell disk is seen on a Late Classic cylindrical vessel from Mundo Perdido (Harrison 1999:136). The way in which this disk is strung provides evidence of how disks may have been worn as personal adornment.

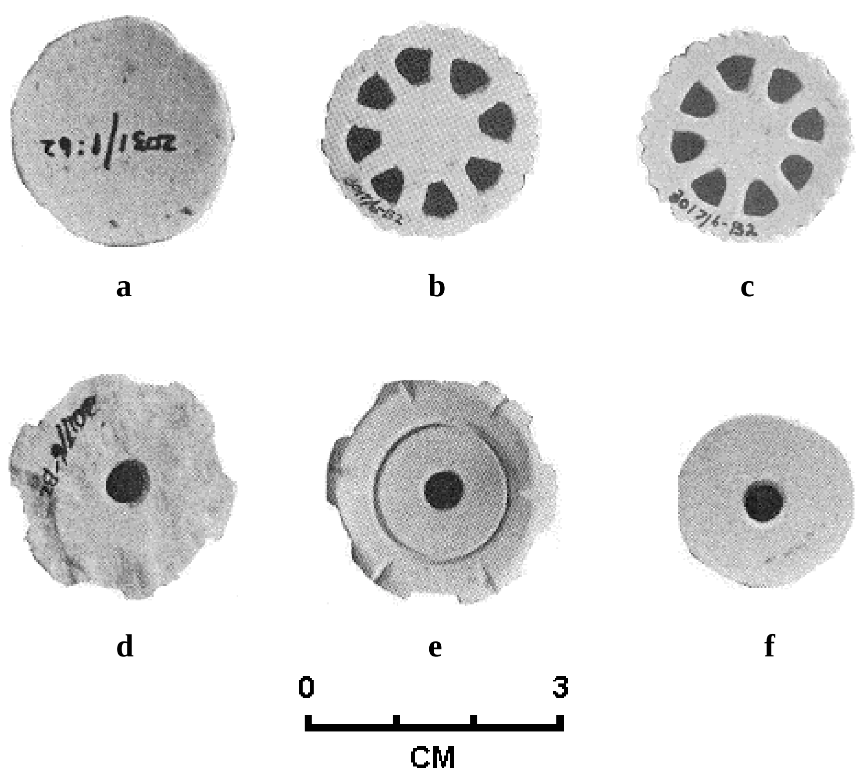


Figure 6.3. Shell Disks: a) unperforated plain (2031 1:62); b-c) unperforated and decorated (3017 6:B2); d-e) perforated and decorated (3017 6:B2); f) perforated plain (2031 3:37) (After Dreiss 1994)

Shell Disks: Unperforated Plain

A total of four unperforated plain shell disks recovered from midden (n=2), cache (n=1), and burial (n=1) contexts are reported from Colha (Figure 6.3.a; Table 6.7; Dreiss 1982, 1994; Stock 1979). Plain shell disks may have functioned as inlays, gaming pieces, or blanks for other artifact forms such as ear plug plates (Dreiss 1994; Eaton 1978; Garber 1989). It is clear that this form was probably multifunctional. Functional interpretations suggested here are based on depositional contexts.

Table 6.7 Shell Disks: Unperforated Plain

Prov.	D	Th	Wt	Species	Context	Comments
late Middle Preclassic						
2031 1:62	2.90	0.50	5.50	Large gastropod, probably *Strombus sp.*	Midden	Edges ground smooth
Late Preclassic						
2012 12:51	1.40	0.21	0.40	*Spondylus*	Burial	One-half of specimen, remaining edges ground smooth
2031 3:14	1.20	0.65	0.85	Coral	Cache	Edges ground smooth
Early Postclassic						
2012 12:12	3.54	3.71	6.25	Large gastropod, probably Strombus sp.	Sherd deposit	

Shell Disks: Unperforated and Decorated

This category includes all shell disks that display surface modification of incising or carving, but do not have a central perforation (Figure 6.3.b-c; Table 6.8.). This subform is represented by two identical elaborately carved shell disks recovered from a burial context (Figure 6.3.b-c; Table 6.8). This form category is similar in style to what is often referred to as rosettes (Willey 1972). However, rosettes are also reported with centrally located perforation and are suggested to have functioned as ear plug plates. A non-perforated carved and incised shell disk is reported from Tikal (Moholy-Nagy 1994:Figure 6.1f).

Table 6.8. Shell Disks: Unperforated and Decorated

Prov.	D	Th	Wt	Species	Context	Comments
Terminal Classic						
3017 6:B2	3.93	0.24	4.51	*Strombus sp.*	Burial	Rotary wheel
3017 6:B2	3.89	0.24	5.59	*Strombus sp.*	Burial	Rotary wheel

Each disk has scalloped edges and eight triangular cut outs around the edges. The form they most resemble is that of a modern "rotary" wheel. The function of these disks is problematic. It is possible that they were used as ornamentation on clothing or part of a mosaic. No similarly decorated disks have been noted.

The disks were recovered from a burial associated with a lithic workshop at Op 3017. The position within the burial of these specimens is currently unknown. The burial contained the remains of a child of approximately seven years and several additional bones of adults (Wilson 1994). The disturbed nature of this burial precludes assigning the disks to any individual.

Shell Disks: Perforated Plain

This subform category is comprised of three examples of plain perforated shell disks reported from midden (n=1), floor (n=1), and unknown (n=1) contexts (Figure 6.3.f; Table 6.9). Plain perforated shell disks may have functioned as pendants, clothing ornamentation, inlays, or throat plates for ear plugs (Hammond 1991a; Lee 1969). This artifact form is noted at several sites including Altar de Sacrificios (Willey 1972), Altun Ha (Pendergast 1979) Cerros (Garber 1981, 1989), Dolores (Eaton 1978), Dos Hombres (Valdez and Buttles 1995), K'axob (Isaza Aizpurúa 1999; Isaza Aizpurúa and McAnany 1999), Mundo Perdido (Diaz 1983), Nebaj (Smith and Kidder 1951), Rancho Ina (López et al.1996), Santa Rita (Sidrys 1983), and Uaxactun (Kidder 1947).

Table 6.9. Perforated Shell Disks Plain

Prov.	**D**	**Th**	**Wt**	**Species**	**Context**	**Comments**
Late Middle Preclassic						
2031 6:123	2.31	0.30	1.66	Nephronaias?	Floor	Edges ground smooth
Late Preclassic						
2031 3:37	2.30	0.34	2.33	Large gastropod, probably *Strombus sp.*	Midden	Edges ground smooth
Late Classic						
2012 5:2	2.85	0.26	3.05	Large gastropod	Unknown	Biconically drilled, erosion has caused pitting on surface of the artifact

Shell Disks: Perforated and Decorated

This subform is comprised of three perforated shell disks that have been incised and/or carved to create surface decorations (Figure 6.3.c-e; Table 6.10). They are reported from burial (n=2) and midden (n=1) contexts. Two elaborately worked specimens (Op. 3017 6:Burial 3) were recovered from the head region of a Terminal Classic burial and may have functioned as ear plug throat plates (Figure 6.3.c-e). A similar specimen is reported from Altar de Sacrificios (Willey 1972: Figure 197). The fragmented specimen from Op 2037 10:2, displays four partial perforation around the outer margins of the specimen.

Table 6.10. Shell Disks: Perforated and Decorated

Prov.	D	Th	Wt	Species	Context	Comments
Terminal Classic						
3017 6:B2	2.89	0.43	3.42	Strombus	Burial	Elaborately cut and incised on interior of shell
3017 6:B2	2.73	0.39	3.91	Strombus	Burial	Elaborately cut and incised on interior of shell
Postclassic						
2037 10:2	0.25	.33	8.76	Strombus	Midden	Fragment; edges ground smooth and cut, four partial perforations visible around the edges evidence of a large central perforation around 1.69 cm in diameter

Perforated shell disks that have been decorated are thought to have functioned as ear plug throat plates. Several sites report perforated, carved, and incised shell disks including Altar de Sacrificios (Willey 1972), Cerros (Garber

1981, 1989), Dos Hombres (Valdez and Buttles 1995), Mundo Perdido (Diaz 1983), Rancho Ina (López et al.1996), Santa Rita (Sidrys 1983), and Uaxactun (Kidder 1947).

Shell Rings

This category is comprised of artifacts whose form resembles that of a modern "ring". A total of three fragments of shell rings have been recovered from surface (n=2) and burial (n=1) contexts at Colha (Table 6.11). Similar rings are described from Seibal (Willey 1978: Figure 168). The function of this artifact form is unknown. Possible functions include garment ornamentation and personal adornment. The positioning of the specimen recovered from the Terminal Classic burial at 3017 B3, is unknown.

Table 6.11. Shell Rings

Prov.	**D**	**Th**	**Wt**	**Species**	**Context**	**Comments**
Late Classic						
2003 22:1	1.30	0.28	0.77	*Nephronaias calamitarum*	Surface	Fragment
Terminal Classic						
3017 B3	1.89	0.14	0.26	*Nephronaias calamitarum*	Burial; female, young adult	Fragment
Unknown						
2012 3	3.27	0.54	3.86		Surface	Fragment

Shell Labret

Labrets are thought to have functioned as either lip or ear ornaments. This is confirmed by their positioning in burial contexts where they are reported as single occurrences as well as in pairs near the cranium (Kidder 1947:64; Hageman, personal communication 2002). A labret is comprised of a shank and a spike. The decorative element is the spike. The shank runs vertical with the spike extending straight out from the top of the specimen. The length of the shank probably dictates where the labret was used.

A single specimen is reported from a Late Classic midden context at Op 2008 1:3. Metric data will not be presented in table format for this specimen as it is better relayed as text. It is carved from a gastropod and takes the overall form of either a mushroom or a phallis. The shank is 3.6 cm in length and the spike is 1.2 cm and it weights 7.6 g. Shell labrets are reported from Altar de Sacrificios (Willey 1972), Altun Ha (Pendergast 1979) Cerros (Garber 1989), Guijarral (Hageman, personal communication 2002), Tikal (Moholy-Nagy 1994), and Uaxactun (Kidder 1947).

Shell Pendants

The shell pendant category includes all carved and perforated shell, other than perforated shell disks that could have been suspended or worn. Six specimens recovered from burial (n=3), midden (n=2), and cooking pit (n=1) contexts are reported (Table 6.12; Figure 6.4).

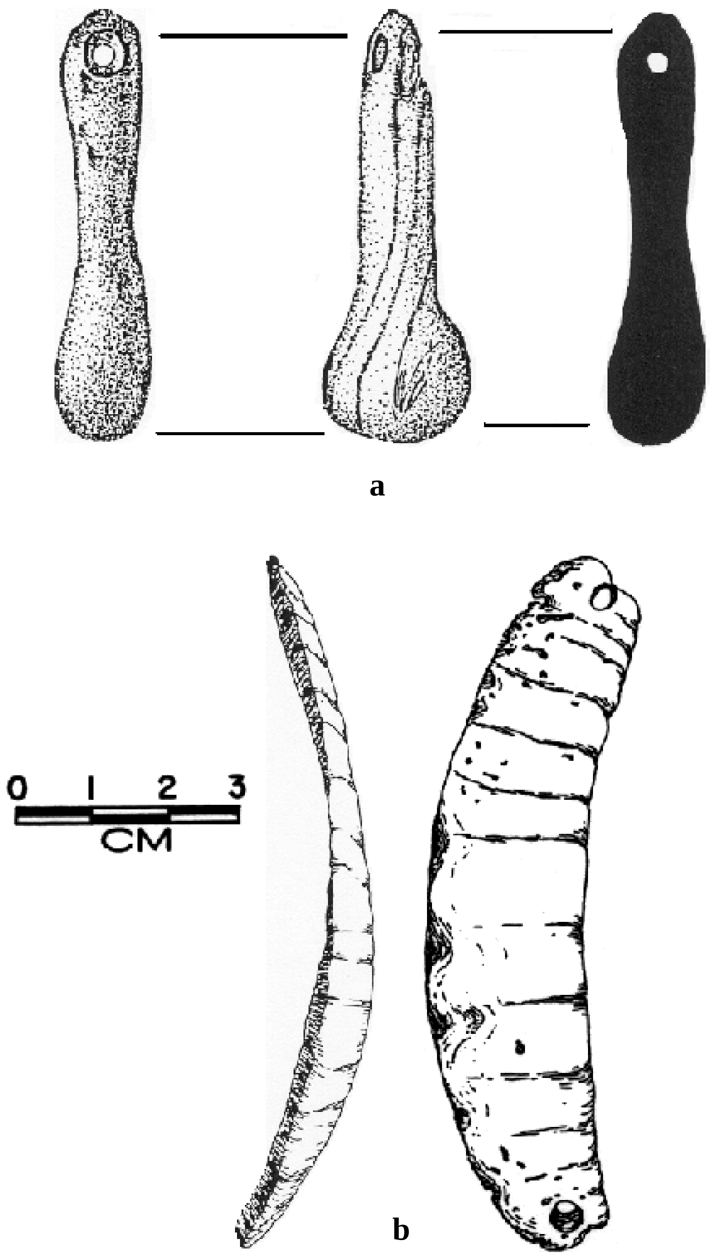


Figure 6.4. Shell Pendants: a) 2012 3:F5; b) 2031 5-6/110

Table 6.12. Shell Pendants

Prov.	L	D	Th	Wt	Species	Context	Comments
early Middle Preclassic							
2012 3:F5	5.70	2.10		14.55	Conch Columella	Cooking pit feature	Edges ground smooth, lateral perforations on smaller end
Late Preclassic							
2003 14:7	1.83		1.22		Gastropod	Midden	Not available for examination
Protoclassic							
2031 5-6/110	9.20	0.40		17.99	*Spondylus*	Burial, adult female	Ventral margin of a *Spondylus* shell perforated at both ends; edges ground smooth; crescent shaped
Terminal Classic							
3017 6:3	4.23	2.95	0.37	6.34	*Strombus*	Child 7 + and other adult bones	Edges ground smooth; triangular with central perforation in the short end. A groove running along the long axis
3017 6:3	4.2	2.96	0.37	7.28	Strombus	Child 7 + and other adult bones	Edges ground smooth; triangular with central perforation in the short end.
Middle Postclassic							
2032 9:1	3.17	2.31	0.48	5.20	Strombus	Midden	Rectangular in form; edges have been broken, evidence of grinding on intact edge. There is a small incised line running between the two perforations

The Protoclassic specimen from Op 2031 5/6:110 was recovered from a San Antonio Golden Brown dish positioned in the lap of a seated adult (40-60 years of age) female (Figure 6.4.b; Sullivan 1991a; Wright n.d.a). Included in the dish also were five fragmented human skulls possibly representing the reburial of ancestors (Sullivan 1991a; Wright n.d.a). It is highly likely that the pendant belonged to one of the individuals represented in the vessel. The seated female and her accompanying burial furniture were sprinkled with a red substance. The exception was the vessel and its contents only the bottom of the vessel displayed this red substance. Thus, the pendant presented here did not exhibit a red substance.

The positioning of the remaining two burial specimens is currently unknown. It is known that the burial contained the remains of a child seven+ years and several additional bones of adults (Wilson 1994). The disturbed nature of this burial precludes assigning the possible pendants to any individual. An interesting attribute of these triangular pendants is the presence of an encircling groove along the long axis. It is possible that these specimens may have actually been sewn onto clothing with the grooves providing extra fastening stability. Similar triangular pendants are noted at El Mirador (Hanson 1990:Figure 131i) and Kaminaljuyu (Kidder et al. 1946:Figure 264a). A specimen similar to the rectangular pendant recovered from Op 2032 9:1 is reported from Chiapa de Corzo (Lee 1969:Figure c).

Shell pendants are reported throughout the Maya area in forms that range from simple to elaborate (Diaz 1983; Garber 1989; Hammond 1991a; Hanson

1990; Isaza Aizpurúa 1999; Isaza Aizpurúa and McAnany 1999; Moholy-Nagy 1994; López et al. 1996; Willey 1972, 1978; Willey et al. 1994). Although the function ascribed to this classification of artifacts is based largely on contextual data they may have also held other functions such as clothing adornments. The small diameter of the perforations precludes them for use as an ear plug throat plate.

Miscellaneous Modified Shell

Included under this category is the modified shell that does not conform to any known form categories and whose function is problematic. Subforms have been created according to the overall morphology and include anthropomorphic, rectangular, square, discoidal, and indeterminate fragments.

Miscellaneous Modified Shell: Anthropomorphic

A delicately carved hand is the only anthropomorphic modified shell artifact in the Colha collection (Figure 6.5; Table 6.13.). The hand was recovered from a Late Preclassic cache at Op 2012 14:30. The overall form suggests that this specimen was part of a composite artifact. It is possible that it may have been part of a figurine or doll (Buttles 1992a). Dreiss (1994) indicates that the hand was carved from the heavy hinge fold of a Pacific variety of *Pinctada mazatlanica*. No similar specimens have been reported.

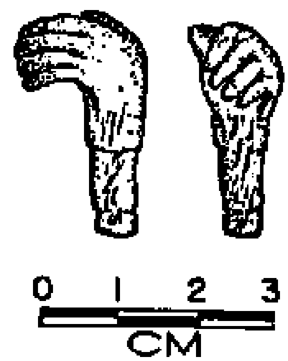


Figure 6.5. Miscellaneous Modified Shell: Carved Hand from Late Preclassic Cache (2012 14:30)

Table 6.13. Miscellaneous Modified Shell: Anthropomorphic

Prov.	L	Wt	Species	Context
Late Preclassic				
2012 14:30	2.85	4.20	*Pinctada mazatlanica*	Cache

Miscellaneous Modified Shell: Rectangular

Two extensively modified shell artifacts with an overall form that is rectangular are reported from unknown contexts (Table 6.14). The first specimen (Op 2012 5:1) displays six partial perforations on what would have been the interior of original complete shell. The edges have recently been fractured. The second specimen from CH 78 A displays no perforations and has edges that have been ground smooth. Willey et al. (1994) report rectangular cut shell from Copan.

The Colha rectangular modified shell may have functioned as inlays or as blanks for producing other shell artifact forms.

Table 6.14. Miscellaneous Modified Shell: Rectangular

Prov.	L	W	Th	Wt	Species	Context	Comments
Unknown							
2012 5:1	2.16	2.02	1.87	0.83	Strombus	Unit cleanup	Six partial perforations
CH 78A	3.86	2.29	0.35	5.79	Strombus	Surface	Ground edges

Miscellaneous Modified Shell: Square

A single specimen recovered from a Terminal Classic sherd deposit at Op 2012 2:3 comprises this subform category (Table 6.15). The specimen is square in shape with a central perforation that is square. It is possible that this artifact may have functioned as an ear plug plate. Similar specimens, but with circular perforations are noted from Altar de Sacrificios (Willey 1972: Figure 197), Ek Luum and Chac Balam (Garber 1994: Figure 67), and Seibal (Willey 1978: Figure 162).

Table 6.15. Miscellaneous Modified Shell: Square

Prov.	L	W	Th	Wt	Species	Context	Comments
Terminal Classic							
2012 2:3	1.06	1.08	0.17	0.23	Strombus	Midden	Ground edges

Miscellaneous Modified Shell: Crescent

This subform category is comprised of two specimens excavated from Middle Postclassic contexts (Table 6.16; Figure 6.6). The first was recovered from a sherd deposit at Op 2032 8:1. It is crescent in form with a central partial perforation in the center.   The second specimen is reported from a midden deposit at Op 2012 12:12 and displays a partial perforation in the center. Both specimens resemble eyes. It is possible that they could have functioned as eye inlays for masks or inlays on structures.

Table 6.16. Miscellaneous Modified Shell: Crescent

Prov.	L	W	Th	Wt	Species	Context	Comments
Early Postclassic							
2012 12:12	2.86	1.95	0.50	1.28	Strombus	Sherd deposit	Ground edges
Middle Postclassic							
2031 8:1	2.85	2.85	0.45	1.25	Spondylus	Midden	Ground edges

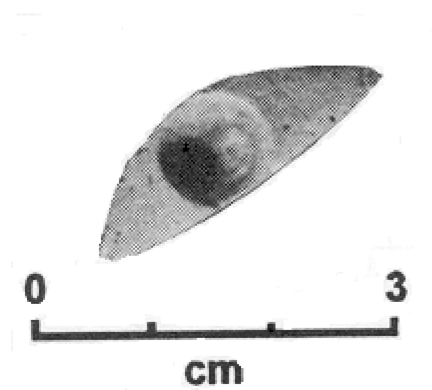


Figure 6.6. Miscellaneous Modified Shell: Crescent, 2012 12:12 (after Dreiss 1994)

Miscellaneous Modified Shell: Indeterminate Fragments

Included under this form category are six fragments of modified *Spondylus* that were recovered from a Protoclassic blood-letting cache at Op 2012 14:55 (Table 6.17; Potter 1994). Evidence of surface decoration and cut marks are visible on a few of the specimens. All six fragments are in a very fragile state, with the surfaces being heavily pitted. A red substance appears on all of the fragments. This substance was also evident on the entire contents of the cache. It is highly possible that the fragments may represent a single artifact.

Table 6.17. Miscellaneous Modified Shell: Indeterminate Fragments

Prov.	L	W	Wt	Species	Context	Comments
Protoclassic						
2012 14:55			2.30	Spondylus	Cache	
2012 14:55			0.76	Spondylus	Cache	Hinge segment
2012 14:55	5.60	3.42	1.63	Spondylus	Cache	Edges cut and ground smooth, cut marks evident
2012 14:55	5.02	2.63	1.62	Spondylus	Cache	Biconical perforation
2012 14:55	3.73	3.31	1.49	Spondylus	Cache	Biconical perforation; ground edges
2012 14:55				Spondylus	Cache	Very small fragment, pitted

WHOLE MODIFIED SHELL

This category is comprised of 177 shell artifacts that retain the majority of their original form. The form categories represented include beads, perforated shell pendants, tinklers, and whole modified shell. With the completeness of the shell, this category provides evidence for long distant trade in marine resources. Several manufacturing techniques are found including cutting, grinding, punching, perforating, and sawing.

Whole Modified Shell Beads

This bead subform category is comprised of 143 shells that maintain their original (natural) form with the addition of a perforation (Table 6.18). The beads are reported from burial (n=129), midden (n=5), cache (n=6), construction related (n=1), and unknown (n=2) contexts. According to Andrews (1969) perforations made in Marginella beads are punched rather than drilled. This is also the case for all the species represented under this subform category.

Table 6.18. Whole Modified Shell Beads

Prov.	**Shell Species**	**Number of Specimens**	**Context**
early Middle Preclassic			
2012 5:15	*Columbella mereatoria*	2	Cache
2012 5:15	*Cardita floridana*	4	Cache
Protoclassic			
2011 14:6	*Columbella mereatoria*	1	Midden
2012 12:34	*Olivella minuta*	127	Burial
2012 12:35	*Olivella minuta*	1	Burial
2012 12:35	*Prunum guttatum*	1	Burial
Late Classic			
2003 4: 2B	*Prunum guttatum*	1	Unknown
2003 14:6	*Prunum guttatum*	1	Unknown
2011 11:4	*Columbella mereatoria*	1	Construction fill
Middle Postclassic			
2003 9:1	*Prunum guttatum*	1	Unknown
2032 2:2	Prunum guttatum	2	Midden
2037 1:7E	Prunum guttatum	1	Midden
2040 Sample C	Prunum guttatum	1	Midden

All beads included under this subform were produced from small shells including: *Olivella minuta*, *Cardita floridana*, *Columbella mercatoria*, and *Prunum guttatum* (Marginella). Of the 143 perforated shell beads 127 are manufactured from the *Olivella minuta* species. The average length for these specimens is 1.35 cm (standard deviation .10 cm) and an average width of .69 cm (standard deviation .75 cm). The four *Columbella mercatoria* specimens have an average length of 2.89 cm (standard deviation 2.55 cm) and an average width of 1.84 cm (standard deviation 1.40 cm).

The early Middle Preclassic specimens were all recovered from one ceramic cache deposit that contained several disk shell beads. This ceramic contained cache is the earliest known from the site of Colha. The Protoclassic burial at Op. 2012 12:34 produced 127 *Olivella minuta* shell beads. Punched *Olivella minuta* may have functioned as beads for necklaces, wrist bands, bracelets, or anklets. In the Southwest of the United States the Hopi Indians utilize these shells as wrist guards and dance bandoleers (Parsons 1974). It is possible that the Maya may have used these beads in a similar fashion.

Although it is quite possible that these specimens functioned as beads they may have also been attached to a garment and functioned in a capacity similar to tinklers. An example of their use on garments is seen at the site of Kaminaljuyu (Kidder et al. 1946: Figure 164b). Similar perforated whole beads are reported from Chiapa de Corzo (Lee 1969), Kaminaljuyu (Kidder et al. 1946), K'axob (Isaza

Aizpurúa 1999; Isaza Aizpurúa and McAnany 1999), Nebaj (Smith and Kidder 1951), Pacbitun (Healy 1990), Tonina (Becquelin and Taladoire 1990), and Uaxactun (Ricketson and Ricketson 1937).

Oliva Shell Tinklers

This shell artifact form is based on a functional classification and a commonality of shell species and morphology. The Colha collection is comprised of 30 tinklers that were derived from midden (n=15), cache (n=4), burial (n=1), fire pit (n=1), and unknown (n=9) contexts (Figure 6.7; Table 6.19). The most common species of shell utilized in the production of tinklers is that of the *Oliva*, and in particular *Oliva sayana* and *Oliva reticularis*, however, other species are reported to occur in the same form (Andrews 1969). A tinkler is made by removing the spire (and sometimes the shoulder) of the *Oliva* shell creating a bell shaped adornment. Incisions and perforations often appear along the body. The most commonly positioned incision/perforation is at the base of the specimen. In many cases, the modifications resemble a face (e.g. Eaton 1978: Figure 32c). Manufacturing techniques utilized in the creation of a tinkler probably included incising, cutting, sawing, and grinding (see Suárez 1974, 1991).

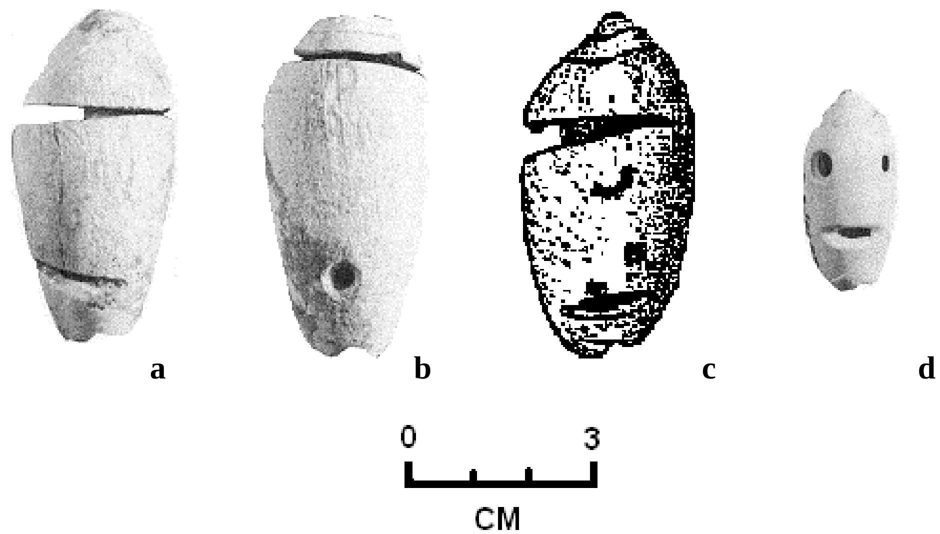


Figure 6.7. Shell Tinklers: a-c) *Oliva sayana* tinklers (2012 14:55); d) *Oliva reticularis* tinkler (After Dreiss 1994)

Table 6.19. Oliva Shell Tinklers

Prov.	L	W	Wt	Context	Comments
early Middle Preclassic					
2012 F5	3.11	1.57	8.40	Cooking Pit Feature	Spire removed
Late Preclassic					
2011 14:7	1.84	1.14	1.56	Midden	Spire and shoulder removed; perforation at base
Protoclassic					
2012 14:55	5.58	2.95	21.72	Cache	Slit 2.1cm below spire extends to outer lip; slit/perforation "eye" at base
2012 14:55	5.71	3.04	25.55	Cache	Spire removed, slit which extends to outer lip just below on shoulder, conically drilled perforation at base

Table 6.19. Oliva Shell Tinklers (continued)

Prov.	L	W	Wt	Context	Comments
2012 14:55	5.53	2.74	19.47	Cache	Slit 2.7cm below spire on the shoulder extends to outer lip; slit/perforation "eye" at base
2012 14:55	5.55	2.71	19.50	Cache	Slit 1.82 cm from spire on shoulder extends to the outer lip slit/perforation "eye" at base
Late Classic					
2011 11:4	2.95	1.65	5.23	Unknown	Spire removed
2012 5:2	4.85	2.48	2.15	Unknown	Spire area fragmented/broken; conical drill hole at base
Terminal Classic					
3017 B3	2.04	1.25	21.72	Burial	Spire removed; 2 perforation at shoulder; one perforation at base and corresponding perforation at base of outer lip
Middle Postclassic					
2001 5:1	2.60	1.61	4.47	Surface & Midden	Spire removed just below shoulder; slit in base
2001 5:2	2.13	1.13	1.53	Midden	Spire removed; fragmented, outer lip missing
2010 1:2	1.91	1.21	2.15	Midden	Spire removed
2010 1:2	1.54	1.06	1.33	Midden	Spire and shoulder removed
2010 1:3	4.55	1.81	7.27	Midden	Spire removed
2010 1:6	2.68	1.54	3.70	Midden	Spire removed; slit at base
2010 2:1	3.30	1.44	3.72	Midden	Shell ground at shoulder and body whorl causing flat perforations and exposing the columella
2010 2:2	2.9	1.30	3.94	Midden	Whole shell with 3 slits in whorl; soil still contained within shell
2010 2:2	3.51	1.67	5.05	Midden	Whole shell with 5 perforations; face like configuration on one side of shell
2010 2:2	2.83		5.42	Midden	Fragment
2032 5:2	3.27	1.71	2.22	Midden	Fragment; only lip portion of shell, evidence of slit
2037 1:5	2.31	1.43	3.32	Midden	Transversely cut; large slit at base of whorl
Postclassic					
2002 1:1	1.95	1.42	2.39	Surface	Spire and shoulder removed
2002 2:1	2.31	1.46	2.87	Surface	Spire removed; slit at base

Table 6.19. Oliva Shell Tinklers (continued)

Prov.	L	W	Wt	Context	Comments
2002 2:1	4.55	1.88	7.41	Surface	Spire removed; slit at base
2003 6:1	2.09	1.02	1.32	Surface	Spire removed; slit at base; part of lip missing
2032 8:3	2.03	1.04	1.39	Midden	Spire partially removed; spiral cord partially intact
2037 13:1	2.39	1.36	2.57	Midden	Spire removed; slit at base
2037 14:1	2.46	1.47	3.56	Midden	Spire removed
Unknown					
? SE 83	4.45	2.09	8.97	Unknown	Fragment
Q1-S	2.46	1.22	2.25	Unknown	Spire removed just above spiral cord; slit with surrounding incising at base and perforation with incising along body whorl; opposite side two slits near shoulder

Tinklers are common to the lowland Maya area and appear from Preclassic to Postclassic contexts (cf. Andrews 1969; Awe 1992; Brady 1990; Cobos 1991; Diaz 1983; Eaton 1978; Garber 1981, 1989, 1995; Isaza Aizpurúa 1999; Isaza Aizpurúa and McAnany 1999; Kidder et al. 1946; Kidder 1947; Lee 1969; López, et al. 1996; Moholy-Nagy 1994; Proskouriakoff 1962; Sidrys 1982; Valdez and Buttles 1995; Valliant 1931; Willey et al. 1965, 1994; Willey 1972, 1978). Recycling of the Oliva spires is seen at the site Rancho Ina (López et al. 1996, Fig. 8) and Nebaj (Smith and Kidder 1951: Figure 68).

Contextual evidence suggests that tinklers may have been worn as pendants however, they are often depicted as being attached to belt assemblages, the base of garments, and on the legs of individuals. These various uses can be observed on stela from Caracol, Stela 6 (Beetz and Satterthwaite 1981); Copan, Stelae A and B

(Kidder et al. 1946); Quiriqua, Stela F (Sharer 1990); Siebal, Stela 10 (Graham 1990); Tikal, Lintel 2, temple III (Coe et al. 1981) and Stela 22 (Harrison 1999), Yaxchilan, Lintel 44, and Xunantunich, Stela 8 (Graham 1979). A Late Classic Lintel, 2, at Piedras Negras illustrates the use of tinklers on battle dress (Schele and Miller 1986:149). Tinklers are also seen dangling from the neck of the Jaguar God of the underworld (Coe 1975: 23).

When used in mass as depicted on the stelae, the proximity of the tinklers would produce sound when in movement. The type or extent of movement would affect the sound produced. The tone produced could be controlled by the amount of spire and/or shoulder removed and the positioning and number of incisions or perforations. The tinkler may have been used in ritual and dance when sound was an important factor. Schele and Miller (1986:181-182) have concluded that some bloodletting rituals included a dance phase. The Protoclassic bloodletting cache from Op 2012 14:55 contained four tinklers and it would be interesting to speculate about their particular function.

It should be noted that several of the depictions referred to above are of kings and elite individuals in full regalia. Elites residing at smaller sites such as Colha may not have been afforded the same access to such costumes. However, the contextual evidence supports that they were able to use some components of the elaborate costumes. It is important to note that the shells themselves probably held ideological significance and are often associated with water and the primordial ocean (Schele and Miller 1986).

Whole Modified Shell Pendants/Pectorals

This category is comprised of four perforated shells that were derived from burial (n=3) and midden (n=1) contexts. These specimens retain the majority of their original form with the addition of perforations that would have allowed for suspension (Table 6.20). It is highly likely that these specimens functioned as pendants or pectorals. Contextual evidence supports this assumption. Further support is provided from stelae and painted vessels in which individuals are depicted wearing whole shells as parts of necklaces (Moholy-Nagy 1994:162).

Table 6.20. Whole Modified Shell Pendants

Prov.	L	W	Wt	Species	Context	Comments
Late Preclassic						
2012 12:51	9.10	4.83	62.00	*Cypraea (Trona) cervus*, "cowrie"	Burial, infant	Single perforation
2012 12:51	10.94	9.32	65.75	*Pinctada mazatlanica*, Pacific species of pearl oyster - bivalve	Burial, infant	Two perforations at the umbo and one along the dorsal margin; large central conical perforation
Protoclassic						
2031 5-6/110	8.22	6.80	8.10	*Spondyllus*	Burial, adult female	Two biconical perforations at valve
Late Classic						
2008 12:3	7.54	4.19	70.02	*Strombus castatus*	Midden	Whole shell with spire and lip cut off; six perforations

Of interest is the Late Preclassic infant burial from 2012 12:51 that included a *Pinctada mazatlanica* (Figure 6.8a) and *Cypraea (Trona) cervus*, "cowrie" (Figure 6.8.b), both Pacific Ocean species as burial furniture. The body of this individual was covered by a ceramic vessel. The shells were positioned adjacent to the vessel. In addition to the suspension perforations, the *Pinctada mazatlanica* shell also has a central oval 1.55 cm section of shell that has been cut away. It is possible that the cut may represent a "killing" of the object in a ritual associated with the burial of the individual. Associated also with this burial was a number of greenstone beads and shell effigy vessel.

The infant burial from 2012 12:51 represents the greatest number of associated grave furniture for any infant burial at Colha. Hammond, Clarke, and Robin (1992) suggest that extensive grave goods associated with child burials imply that, wealth and/or status were ascribed not earned, and the possibility of social ranking. Hayden (1995) believes that in “transegalitarian” societies this investment actually represent that of the parent. It is apparent that a great deal of investment was made toward this infant. At K’axob, Isaza Aizpurúa and McAnany (1999:124) concluded that during the Preclassic worked shell was an identification marker for children.

The third perforated shell, is a single valve of the bivalve *Spondylus* which was part of the burial furniture of a Protoclassic burial at Op. 2031 5-6:110 (Buttles 1991a, 1991b; Sullivan 1991c; Wright 1991). The exterior spines have been removed, and the valve and outer edges have been ground smooth. Two biconical perforations are positioned at the valve. The perforations would allow for suspension with either the exterior or interior of the shell facing outward. Several greenstone beads were also part of the burial furniture and together with the shell probably formed an elaborate necklace.

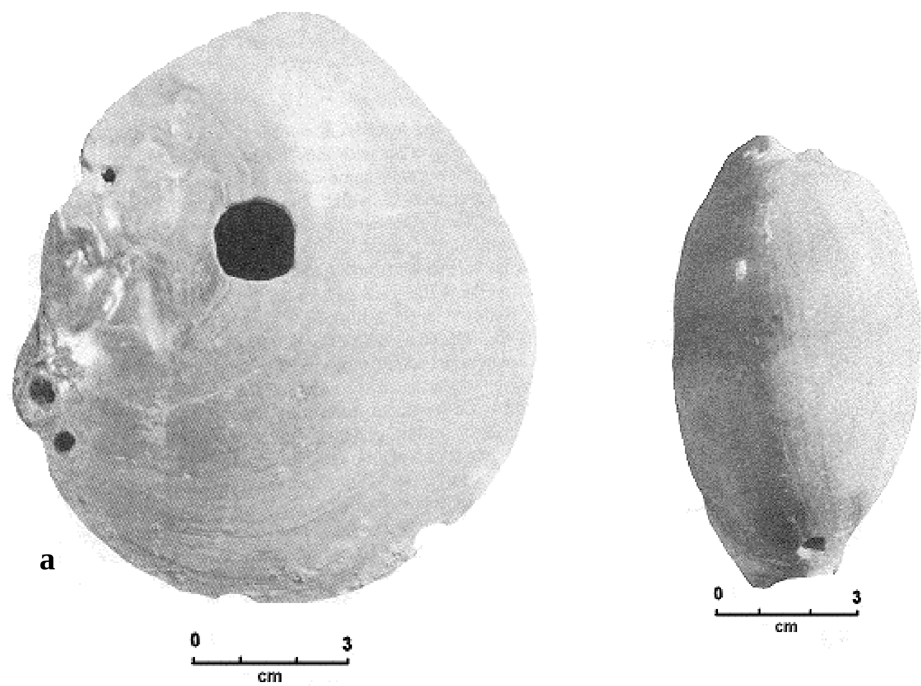


Figure 6.8. Whole Perforated Shell: a) *Pinctada mazatlanica* (2012 12:51); b) *Cypraea (Trona) cervus,* "cowrie" (2012 12:51) (After Dreiss 1994)

The remaining perforated shell was recovered from a Late Classic midden and may have functioned as a pendant. Because this specimen displays six perforations and the edges remain unground it is possibly that it may represent practice attempts at creating perforations. This specimen was unavailable for examination.

Similar perforated “cowrie” shells are reported from Cuello (Hammond 1991a) and Mundo Perdido (Diaz 1983; National Museum of Guatemala display). Perforated Spondylus valves from burial contexts with proposed functions as pendants or pectorals are reported from several lowland sites including Altar de Sacrificios (Willey 1972), Aventura (Sidyrs 1983), Cerros (Garber 1989), Chiapa de Corzo (Lee 1969) Copan (Willey et al. 1994), El Mirador (Hanson 1990) Río Azul (Hall 1987) and Tikal (Moholy-Nagy 1994). Spondylus shells were probably prized for their natural red hues.

CONTEXTUAL PATTERNS AND TRENDS

Within the Colha portable material culture are 1,519 artifacts manufactured from shell. Analysis revealed two classes of shell artifacts relating to extent of modification: 1) 1,342 artifacts that through extensive modification no longer retain any of their original shell form, and 2) 177 artifacts that retain the majority of their original shell form.

Table 6.21. Temporal Distribution of Shell Artifacts

Artifacts		Temporal Data									
Artifact Form	**Subform**	**eMP**	**LMP**	**LPC**	**PRC**	**LC**	**TC**	**EPC**	**MPC**	**PC**	**Unknown**
Extensively Modified Shell											
Beads											
	Disks	425	724	118	16						
	Blanks	14		4							
	Tubular				7						
Shell Disks											
	Unperforated Plain		1	2				1			
	Unperforated and Decorated						2				
	Perforated Plain		1	1		1					
	Perforated and Decorated						2			1	
Rings						1	1				1
Labret						1					
Pendant		1		1	1		2		1		
Misc. Carved											
	Anthropo-morphic			1							
	Rectangular										2
	Square						1				
	Crescent							1	1		
	Fragments				6						
Whole Modified Shell											
Beads		6			130	3			4		
Tinklers		1		1	4	2	1		12	7	2
Pendant				2	1	1					
TOTAL		**447**	**726**	**130**	**165**	**9**	**9**	**2**	**18**	**8**	**5**

Table 6.22. Contextual Distribution of Shell Artifacts

Artifacts		**Contextual Data**								
Form	**Subform**	**Burial**	**Cache**	**Midden**	**Construction fill**	**Fire pit**	**Post mold**	**Floor**	**Sherd deposit**	**Unknown**
Extensively Modified Shell										
Beads										
	Disks	1134	121	18		4				7
	Blanks	4	1	1			12			
	Tubular	4	3							
Shell Disks										
	Unperforated Plain	1	1	2						
	Unperforated and Decorated	2								
	Perforated Plain			1				1		1
	Perforated and Decorated	2		1						
Rings		1								2
Labret				1						
Pendant		3		2		1				
Misc. Carved										
	Anthropo-morphic		1							
	Rectangular									2
	Square								1	
	Crescent								1	1
	Fragments		6							
Whole Modified Shell										
Beads		129	6	5	1					2
Tinklers		1	4	15		1				9
Pendant		3		1						
TOTAL		**1284**	**143**	**46**	**1**	**6**	**12**	**1**	**2**	**24**

Shell artifacts at Colha were recovered from contexts ranging from early Middle Preclassic to Middle Postclassic (Table 6.22). By far the largest part of the shell assemblage is attributed to the Preclassic period. As illustrated in Table 6.22, distinct contextual and distributional patterns are found.

The majority of shell artifacts, 1,284 (84.5%) were recovered from burial contexts (Table 6.23). Accounting for the largest percentage of burial artifacts were the 1,134 disk beads that were recovered from male, female, and infant burials. The beads were positioned at the legs, arms, and chest regions of the individuals. The shell beads most likely functioned as composite components for arm bands, bracelets, necklaces, wristlets, and waistlets.

Table 6.23. Shell Artifacts from Burial Contexts

Form	Subform	eMP	lMP	LPC	PRC	TC
Extensively Modified						
Beads						
	Disk	303	698	117	16	
	Blanks	4				
	Tubular				4	
Disks	*Unperforated Plain*			1		
	Unperforated and Decorated					2
	Perforated and Decorated					2
Ring						1
Pendants					1	2
Whole Modified Shell						
Beads					129	
Tinkler						1
Pendants				2	1	
TOTAL		**307**	**698**	**120**	**151**	**8**

The pattern of including shell disk beads as burial furniture is first seen during the early Middle Preclassic and continues into the late Middle Preclassic. During the Middle Preclassic numerous beads were positioned near the legs and arms of extended supine, semi-flexed, and tightly flexed individuals. Overall, Middle Preclassic burials tend to be uniform in their placement and burial furniture contents (Buttles 1992a). This uniform Middle Preclassic pattern, including the placement of disk shell beads, is also found at the sites of Cuello (Hammond 1991a) and K'axob (Isaza Aizpurúa 1999; Isaza Aizpurúa and McAnany 1999). A single burial of early Middle Preclassic date from Altun Ha produced 373 disk shell beads (Pendergast 1979:173, Burial C-13/27).

Beads identical to those recovered from Middle Preclassic burials were also contained within the earliest ceramic cache at Colha from Op 2012 (Potter 1981). Within the Consejo Red bowl were 97 perforated disk beads (Valdez 1987). It is clear that this bead form held significance during the Middle Preclassic. However, the specific significance is yet to be understood. It is possible that the beads were part of a funerary ritual and were not worn during the lifetime of the individual. It is interesting to note that very few disk shell beads were recovered from midden deposits.

By the Late Preclassic the pattern of the inclusion of numerous disk beads has terminated at Colha. However, they do continue to occur in much smaller quantities in Late Preclassic to Protoclassic burials. They also continue to appear in mass during the Late Preclassic to Protoclassic period at the site of Caracol (Brown, personal communication 2002).

After the Preclassic period, very few shell artifacts are reported from burial contexts. The exception is found at Op 3017 were several shell artifacts were recovered from burials associated with a Late Classic/Terminal Classic lithic workshop (Wilson n.d.; Meadows and Wilson n.d.).

Cache deposits containing shell are restricted to the Preclassic period. One cache is represented from the early Middle Preclassic, two from the Late Preclassic and one from the Protoclassic. During the Classic period, shell is predominantly recovered from midden deposits.

Of the four whole shell pendants, three Pacific derived species are reported from Preclassic burials (see Table 6.19). A single burial containing the remains of an infant produced two of the specimens. The Late Classic midden derived pendant is associated with a household.

Postclassic shell artifacts are primarily limited to whole modified shell (n=23). The exception is the two crescent shaped shell pieces recovered from Postclassic deposits (Figure 6.7). The majority (n=18 or 78.2%) of Postclassic shell artifacts were recovered from Middle Postclassic midden contexts.

CHAPTER 7

RAW MATERIAL: BONE

BONE AND TEETH ARTIFACTS

Analyses of the Colha faunal remains indicate that the Colha inhabitants relied heavily on both terrestrial and aquatic species as a source of food (Scott 1980; Stock 1979; Shaw 1991a; Shaw and Mangan 1994). One of the byproducts of this subsistence strategy is bone and teeth. Therefore, a source of bone for the production of bone artifacts was readily available. The majority of bone artifacts are manufactured from the bones of medium to large mammals. The most represented mammals are white-tailed deer (*Odocoileus virginianus)*, brocket deer *(Masama sp),* and paca *(Cuniculus paca).*

Manufacturing techniques represented in the Colha bone artifact assemblage include breaking, carving, cutting, drilling, flaking, grinding, groove and snap, percussion shattering, and polishing. Evidence of bone artifact production at Colha during the Preclassic is provided by Shaw (1991a: 231) who has identified waste fragments associated with bone artifact production. She further notes that 20 diaphyseal tubes and fragments exhibit evidence of the groove and snap technique. The author examined the diaphyseal tubes from the Early and Middle Postclassic midden at Op 2010 and found ten tubes that display evidence of the groove and snap technique (Figure 7.1). The Early to Middle Postclassic midden at Op 2010

(Taylor 1980:135) produced a large quantity of unworked bone tubes and tube fragments. Context suggests that bone production at Colha was occurring at the household level.

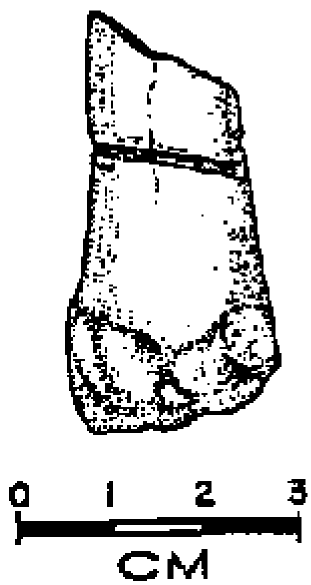


Figure 7.1. Groove and Snap Technique (after Shaw 1991a:231)

The method of manufacture of bone artifacts can be classified as a subtractive process. Because of its subtractive nature, and lack of uniformity in bone size, shape, and thickness, some variation within form and subform categories is to be expected. A total of 165 bone artifacts is reported from Colha (Buttles

1992a; Shultz n.d.; Scott 1980; Stock 1979). Several form categories are represented including beads, tubes, disks, rasps, possible ear flare, perforated teeth, and tapered bone objects. Several subform categories are also present.

Bone Beads

The Colha bone bead collection includes five subforms, anthropomorphic, tubular, barrel, peanut, and fish vertebrae beads. Lee (1969:162) suggests that the groove and snap method was probably utilized in the manufacture of beads and tubes made from animal long bones. Diaphyseal tubes or hollowed long bones were probably used to produce beads. The overall shape of the bead is a reflection of the animal size and the section of long bone from which the bead was cut. The addition of carving and grinding helped to produce a more consistent form.

Beads manufactured from animal bones are reported from Altar de Sacrificios (1972), Barton Ramie (Willey et al. 1965), Cerros (Garber 1989), Chac Balam (Garber 1995) Chiapa de Corzo (Lee 1969), Cuello (Hammond 1991a), San Juan (Garber 1995), Seibal (1978), and Tikal (Moholy-Nagy 1994). The Colha bone bead forms conform in size and shape to those reported above.

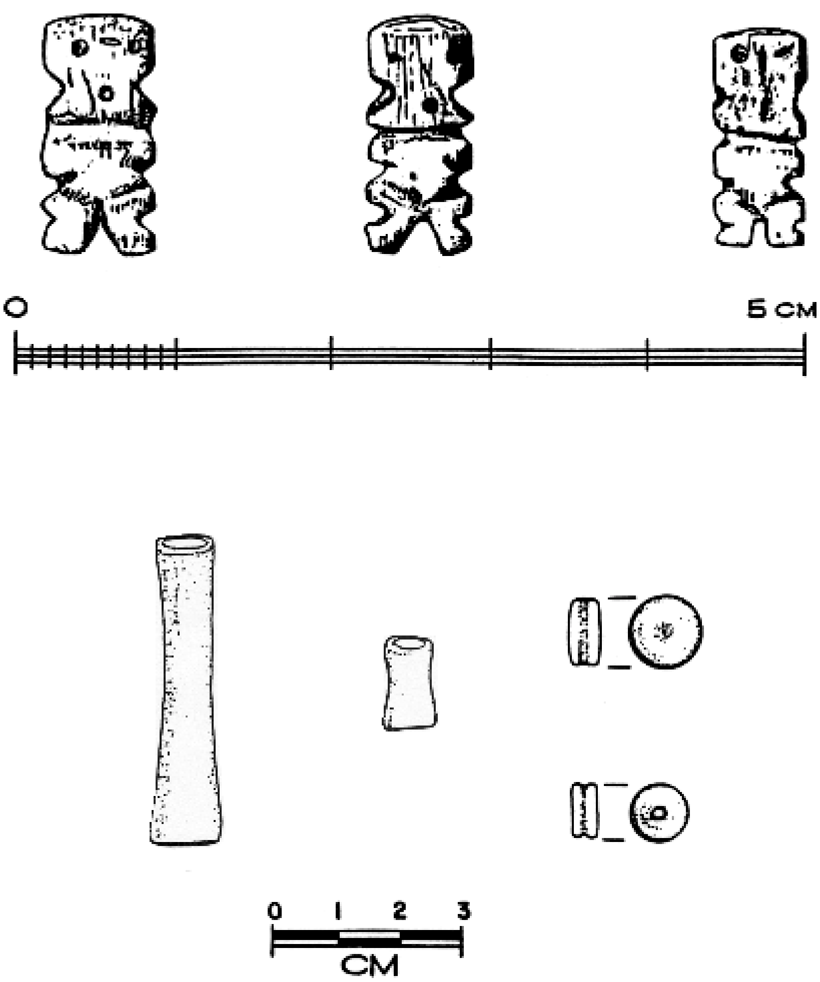


Figure 7.2. Bone Beads: a) anthropomorphic (after Potter 1982); b) tubular; c) peanut; d) fish vertebrae (after Shaw 1991)

Bone Beads: Anthropomorphic

This category is comprised of 33 Preclassic anthropomorphic beads recovered from burial (n=32) and construction related (n=1) contexts (Figure 7.2a; Table 7.1). The 32 beads from Op 2012 B5 were recovered from the lower chest and arm region of a Late Preclassic burial (Potter 1982). The beads are generally uniform and consist of a head, torso, and parted legs (Figure 7.2a). The eyes and mouths are represented by drilled holes and an incision appears at the neck. Suspension holes run laterally through the heads. It is suggested that the beads were strung and worn as a composite necklace. The 2012 B5 burial also included a perforated bone bar and additional bone artifact forms. The beads may have been suspended from the bone bar.

Table 7.1. Bone Beads: Anthropomorphic

Prov.	**L**	**W**	**Th**	**Wt**	**Context**	**Comments**
early Middle Preclassic						
2012 3:15	1.23	0.45	0.42	0.09	Construction fill	
Late Preclassic						
2012 B5	1.35	0.68	0.31	0.40	Burial	
2012 B5	1.24	0.55	0.31	0.33	Burial	
2012 B5	1.43	0.38	0.29	0.48	Burial	
2012 B5	1.40	0.38	0.34	0.47	Burial	
2012 B5	1.32	0.61	0.31	0.35	Burial	
2012 B5	1.49	0.66	0.34	0.46	Burial	
2012 B5	1.30	0.70	0.35	0.49	Burial	
2012 B5	1.25	0.65	0.35	0.40	Burial	
2012 B5	1.37	0.60	0.31	0.40	Burial	
2012 B5	1.45	0.69	0.31	0.40	Burial	
2012 B5	1.28	0.62	0.32	0.39	Burial	
2012 B5	1.25	0.56	0.31	0.37	Burial	
2012 B5	1.24	0.62	0.30	0.37	Burial	
2012 B5	1.20	0.60	0.32	0.32	Burial	
2012 B5	1.22	0.62	0.31	0.33	Burial	

Table 7.1. Bone Beads: Anthropomorphic (continued)

Prov.	L	W	Th	Wt	Context	Comments
2012 B5	1.42	0.66	0.35	0.49	Burial	
2012 B5	1.22	0.57	0.31	0.36	Burial	
2012 B5	1.27	0.57	0.30	0.32	Burial	
2012 B5	1.40	0.62	0.27	0.30	Burial	
2012 B5	1.32	0.54	0.31	0.36	Burial	
2012 B5	1.17	0.60	0.31	0.29	Burial	
2012 B5	1.30	0.60	0.30	0.30	Burial	
2012 B5	1.27	0.60	0.32	0.30	Burial	
2012 B5	0.85	0.56	0.26	0.19	Burial	Torso fragment
2012 B5	0.87	0.70	0.26	0.23	Burial	Torso fragment
2012 B5	0.86	0.56	0.25	0.20	Burial	Torso fragment
2012 B5	0.94	0.58	0.24	0.20	Burial	Torso fragment
2012 B5	0.85	0.61	0.27	0.19	Burial	Torso fragment
2012 B5	0.99	0.60	0.26	0.23	Burial	Torso fragment
2012 B5	0.81	0.59	0.25	0.18	Burial	Torso fragment
2012 B5	0.62	0.67	0.22	0.12	Burial	Torso fragment
2012 B5	1.35	0.68	0.31	0.40	Burial	Torso fragment

The remaining bead is reported from an early Middle Preclassic arbitrary level at Op 2012 3:15. It has been crudely carved into the form of human body with a lateral perforation through the head.

Bone Beads: Tubular

A total of 10 tubular bone beads were recovered from burial (n=6), midden (n=3), and unknown (n=1) contexts. The tubular beads that comprise this subform category were made from diaphyseal tubes using the groove and snap production technique (Table 7.2). Tubular beads generally have a length greater than its diameter and straight parallel sides (Figure 7.2b). However, the tubular bone beads are not a uniform shape which is probably a reflection of the section of bone from which the beads were cut. Some of the beads have expanding ends, while others are slightly concave or convex in profile. The Colha tubular bone beads are similar in form to those reported from Cerros (Garber 1989), Chiapa de Corzo (Lee 1969), Cuello (Hammond 1991a), El Mirador (Hanson 1990), and Uaxactun (Kidder 1947).

Table 7.2. Bone Beads: Tubular

Prov.	L	D	Wt	Context	Comments
early Middle Preclassic					
2031 3:38A	1.48	0.74	0.55	Midden containing burials	Fragmented into four pieces; ends ground smooth
late Middle Preclassic					
2012 12:74	1.70	1.23	1.61	Burial	Expanding ends and lateral cut marks
2012 12:74	1.55	1.23	1.21	Burial	Expanding ends
2012 12:74	1.45	1.00	1.02	Burial	Expanding ends with horizontal cut marks
2012 12:61	3.51	1.22	2.01	Burial	One end expands, cut marks present on one end only; weight includes burial soil within the bead
2012 12:61	4.36	0.94	2.88	Burial	Medium polish, weight includes burial soil within the bead
2012 12:61	3.76	0.78	2.85	Burial	Bird bone; parallel encircling incisions at each end, lateral cut marks across specimen, medium polish; weight includes burial soil within bead
Late Preclassic					
2031 7:173	3.21	0.52	0.08	Rubble and midden fill	Cut marks, light polish
2031 1:41	2.07	0.52	0.08	Rubble and midden fill	Incising or cut marks around middle of specimen, edges ground smooth, bird bone

Table 7.2. Bone Beads: Tubular (continued)

Prov.	L	D	Wt	Context	Comments
Unknown					
Shaw (1991:Fig. 10d)				Unknown	

Three of the tubular beads were recovered from a late Middle Preclassic burial containing two individuals at Op 2012 12:74. The beads were located at the left and right wrists of one of the individuals. The beads in conjunction with disk shell beads were probably worn as bracelets. An additional three tubular beads were recovered from another late Middle Preclassic burial at Op 2012 12:61. The positioning of the Op 2012 12:61 beads is unknown however, they probably served as personal adornment. Of the three remaining tubular beads one is reported from an early Middle Preclassic midden containing four burials, a Late Preclassic burial, and another from a Late Preclassic midden. One additional specimen is reported in Shaw (1991:Figure 10d) but was not available for analysis.

Bone Beads: Barrel

A total of 26 late Middle Preclassic beads of the barrel subform have been recovered from burial (n=25) and unknown (n=1) contexts at Colha (Table 7.3). Barrel shaped beads have a length greater than their diameter and taper at both ends. The barrel shape is probably a result of the shape of the bone from where the beads were removed.

A burial (Op 2012 12:74) containing the remains of two individuals produced 25 of the barrel beads. The barrel beads were recovered from the wrists of one of the individuals. The bone beads along with numerous disk shell beads probably functioned as composite bracelets. The remaining bead was located within an arbitrary level at Op. 2012.

Table 7.3. Bone Beads: Barrel

Prov.	L	D	Wt	Context	Comments
late Middle Preclassic					
2012 3:15	1.00	0.75	0.39	Arbitrary level	
2012 12:74	0.95	1.10	0.60	Burial	
2012 12:74	0.62	0.96	0.50	Burial	
2012 12:74	0.70	1.00	0.52	Burial	
2012 12:74	0.70	0.82	0.30	Burial	
2012 12:74	0.93	1.00	0.50	Burial	
2012 12:74	1.00	1.00	0.55	Burial	
2012 12:74	0.87	1.00	0.50	Burial	
2012 12:74	0.95	0.97	0.50	Burial	
2012 12:74	1.00	1.00	0.52	Burial	
2012 12:74	1.10	0.84	0.50	Burial	
2012 12:74	0.90	0.92	0.48	Burial	
2012 12:74	1.00	1.10	0.65	Burial	Horizontal cut marks
2012 12:74	0.84	1.00	0.50	Burial	
2012 12:74	0.80	1.20	0.50	Burial	
2012 12:74	0.63	1.00	0.40	Burial	
2012 12:74	0.81	1.00	0.40	Burial	
2012 12:74	0.70	1.05	0.50	Burial	
2012 12:74	0.74	0.83	0.53	Burial	
2012 12:74	0.85	1.00	0.48	Burial	
2012 12:74	0.65	0.95	0.48	Burial	
2012 12:74	0.68	1.00	0.48	Burial	
2012 12:74	0.58	1.00	0.30	Burial	
2012 12:74	0.60	0.95	0.30	Burial	
2012 12:74	0.60	1.17	0.32	Burial	Horizontal cut marks
2012 12:74	0.65	0.98	0.35	Burial	

Bone Beads: Peanut

The peanut subform category is represented by three specimens recovered from burial (n=2) and unknown (n=1) contexts (Figure 7.2c; Table 7.4). The two beads from the late Middle Preclassic burial at Op 2012 12:74 probably functioned as a component of a composite bone and shell disk bead bracelet. The remaining peanut shaped bead is reported by Shaw (1991:Figure 10e) and was not available for examination.

Table 7.4. Bone Beads: Peanut

Prov.	L	D	Wt	Context
late Middle Preclassic				
2012 12:74	1.43	0.66	0.93	Burial
2012 12:74	1.41	0.53	0.75	Burial
Unknown				
Shaw 1991a (Figure 10e)				Unknown

Bone Beads: Fish Vertebrae Beads

This bead subform is comprised of 22 fish vertebrae beads recovered from construction related (n=18) and midden (n=4) contexts (Figure 7.2c; Table 7.5). Modifications of the fish vertebrae consist of grinding along the sides and edges and expansion of the naturally occurring central perforation. Similar fish vertebrae beads are reported from Kaminaljuyu (Kidder et al. 1946).

Table 7.5. Bone Beads: Fish Vertebrae

Prov.	D	Th	Wt	Context	Comments
early Middle Preclassic					
2031 3:38A	0.94	0.41	0.24	Midden containing burials	Biconical hole; edges ground to remove holes
late Middle Preclassic					
2011 2:4	1.47	0.72	0.67	Construction fill	Conical perforation-edges ground to remove holes
2011 2:4	0.92	0.49	0.21	Construction fill	Edges ground to remove holes-biconical perforation
2011 2:4	0.76	0.36	0.12	Construction fill	
2011 2:4	0.85	1.8	0.52	Construction fill	Biconical hole; edges ground to remove holes
2031 3:50	1.15	0.58	0.45	Construction fill	Holes still present
Late Classic					
4044 1:6	1.24	0.39	0.28	Construction fill	Holes still present
4044 1:7	1.27	0.61	0.60	Construction fill	Edges ground to remove holes
4044 1:7	1.07	0.23	0.11	Midden	Edges ground to remove holes
4044 1:8	1.05	0.5	0.36	Midden	
4044 1:9	1.19	0.55	0.59	Midden	Fragmented; edges ground to remove holes
4044 1:9	0.71	0.40	0.12	Construction fill	Edges ground to remove holes
4044 1:9	0.79	0.4	0.13	Construction fill	
4044 1:9	0.68	0.32	0.10	Construction fill	Edges ground to remove holes-conical perforation
4044 1:5	0.92	0.46	0.21	Construction fill	Edges ground to remove holes
2011 1:5	0.93	0.46	0.20	Construction fill	
2011 1:5	1.66	0.80	0.98	Construction fill	Conical perforation; edges ground to remove holes

Table 7.5. Bone Beads: Fish Vertebrae (continued)

Prov.	D	Th	Wt	Context	Comments
Terminal Classic					
4044 1:4	0.91	0.48	0.23	Construction fill	Edges ground to remove holes- biconical perforation
Middle Postclassic					
4044 1:2	1.03	0.48	0.30	Construction fill	
4044 1:2	1.03	0.22	0.13	Construction fill	Biconical hole; edges ground to remove holes
4044 1:1	1.04	0.5	0.31	Construction fill	
4044 1:1	1.15	1.67	0.20	Construction fill	Holes still present

Bone Tubes

This category is comprised of 24 artifacts that have been produced from diaphyseal tubes of dog, peccary, and deer sized mammals (Figure 7.3; Table 7.6, 7.7, and 7.8). At Colha three subforms of bone tubes are found, plain tubes, decorated tubes, and perforated and decorated tubes. Bone tubes were produced by removing the epiphyseal end of the tubes probably through the groove and snap technique. Evidence for the manufacture of bone tubes at Colha is seen on numerous specimens that display the cut marks indicative of the groove and snap production technique (see Shaw 1991a:Figure 11e).

Bone tubes are thought to have functioned as handles, rasps, or pendants (Willey 1972). Plain tubes may have been decorated with perishable material or stucco. Lee (1969:162) reports a human femur from Chiapa de Corzo that displays evidence of paint. Plain and elaborately carved bone tubes are reported throughout the Maya area (cf. Becquelin and Taladoire 1990; Coe 1959; Garber 1989; Hammond 1991a; Hanson 1990; Healy 1990; Kidder 1947; Laporte 1998; Lee 1969; Moholy-Nagy 1994; Proskouriakoff 1962; Ricketson and Ricketson 1937; Sheets 1978; Shaw 1991; Willey et al. 1965, 1994; Willey 1972, 1978).

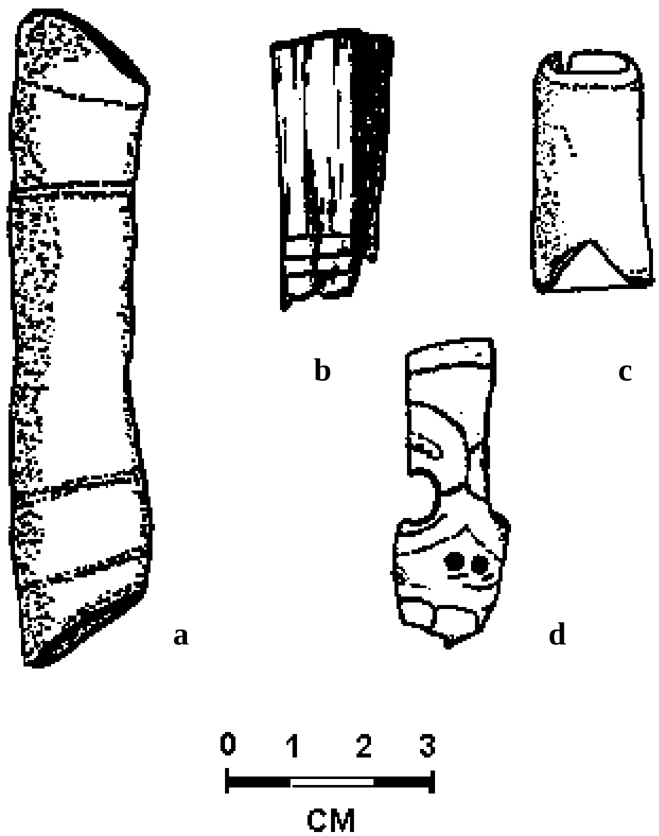


Figure 7.3. Bone Tubes: a) decorated bone tube from Late Preclassic burial at Op 2012; b) Late Preclassic decorated bone tube (after Shaw 1991:233); c) early Middle Preclassic plain bone tube fragment (after Scott 1980:319); d) perforated and decorated bone tube (after Shaw 1991:233)

Bone Tubes: Plain

A total of 19 Preclassic plain bone tubes was recovered from unknown (n=13), midden (n=3), burial (n=2), and construction related (n=1) context at Colha (Figure 7.3c; Table 7.6). Only 5 specimens were available for this analysis. The remaining 13 are reported in Shaw (1991a). Contextual and metric data were not available however, temporal information was provided. Two Late Preclassic burials at Op 2012 contained plain bone tubes. The tubes were recovered from the upper body area of the individuals. In addition, each burial was also interred with bone tubes of the carved and incised subform. Potter (1991, personal communication) suggests that the bone tubes were strung and worn. It is also possible that they could have function as handles, holding feathers or other such perishable materials.

Table 7.6. Bone Tubes: Plain

Prov.	**L**	**D**	**Wt**	**Polish**	**Context**	**Comments**
early Middle Preclassic						
2012					Unknown	Four specimens reported in Shaw (1991a)
2031					Unknown	Four specimens reported in Shaw (1991a)
2031 3:38A	4.83	1.04	2.82	Light	Midden containing burials	Dog femora (Shaw 1991a:235)
late Middle Preclassic						
2011 2:4	4.50				Midden	Not available for examination

Table 7.6. Bone Tubes: Plain (continued)

Prov.	L	D	Wt	Polish	Context	Comments
Late Preclassic						
2012					Unknown	One specimen reported in Shaw (1991a)
2012 3:B2	4.99		3.29	Medium	Burial	Fragment; one-half of tube
2012 3:B3	8.40	2.50	29.05	N/A	Burial	Weight reflects burial soil within tube;
2031					Unknown	Four specimens reported in Shaw (1991a)
2031 1,2:37	3.56	1.88	7.65	Medium	Construct-ion fill	Ends ground smooth
Middle Postclassic						
2010 1:4	5.19	2.01	7.14	Light	Midden	Fragment

Bone Tubes: Decorated

Excavations at Colha have produced three carved and incised bone tubes from burial (n=2) and midden (n=1) contexts (Table 7.7). The first specimen is reported from a late Middle Preclassic midden at Op 2011 2:4 and displays three consecutive encircling incised lines on one end of the specimen. The remaining two decorated bone tubes were recovered from two Late Preclassic burials. Both specimens from Op 2012 specimens have encircling incisions at each end. Similar decorated bone tubes are reported from Chiapa de Corzo (Lee 1969: Figure 118 a-c). Both specimens were recovered from the upper body of the individuals. This has led the excavator to conclude that they were probably strung and worn (Potter, personal communication 1991). However, it is possible that they may have served as handles.

Table 7.7. Bone Tubes: Decorated

Prov.	L	D	Wt	Polish	Context	Comments
late Middle Preclassic						
2011 2:4	4.51	1.81	5.93	N/A	Midden	Three incised lines 2.89 cm from top
Late Preclassic						
2012 3:B2	13.50	1.40	19.50	N/A	Burial	Represents half of the tube; tube tapers in the middle and at both ends; incising is present at both ends
2012 3:B3	9.85	2.10		N/A	Burial	Weight reflects burial soil within tube; two incised line circling the specimen on both ends; ends ground smooth

Bone Tubes: Perforated and Decorated

Two Late Preclassic perforated bone tube fragments were recovered from midden contexts at Colha (Figure 7.6d; Table 7.8). The perforated tube form may have function as flutes. It is also possible that the perforations were used as suspension holes to string the tube to wear as an adornment. Suspension hole(s) could have also been used to suspend fans around the neck.

A variety of musical instruments are known from the Maya area including ocarinas, rasps, flutes, and drums (Healy 1988). The Bonampak murals provide evidence of their use in ritual context. Lee (1969:160, Figure 115) suggests that two of the perforated carved and incised bone tubes from Chiapa de Corzo may be have functioned as flutes. Willey (1972:235) reports a similar perforated bone tube from Altar de Sacrificios. Examples of ceramic flutes are reported from the sites of Lubaantun (Hammond 1975) Pacbitun (Healy 1988), and Río Azul (Valdez, personal communication 2002).

Table 7.8. Bone Tubes: Perforated and Decorated

Prov.	L	Wt	Polish	Context	Comments
Late Preclassic					
2012 3:14	2.65	1.51	Medium	Midden	Small end fragment; end is ground smooth, an circling incised line on one end evidence of an exterior hole
2031 2:17	4.62	2.66	Medium	Midden	Small end fragment; end is ground smooth, incised decoration and two partial perforations; evidence of an exterior hole of .78 cm

Bone Rasps

Bone rasps at Colha are represented by four specimens recovered from construction related (n=2), unknown (n=1), and midden (n=1) contexts (Table 7.9; Buttles 1992a; Scott 1980; Schultz n.d). Rasps are thought to have functioned as musical instruments (Eaton 1978; Hammond 1975; Healy 1988). They are commonly reported as being produced from animal bone, predominantly long bones. However, rasps manufactured from human long bones are reported from Chiapa de Corzo (Agrineir 1960; Lee 1969). A rasp typically consists of a series of parallel cut or incised lines usually along the long access of the specimen. Sound is produced by dragging an object up and down the lines.

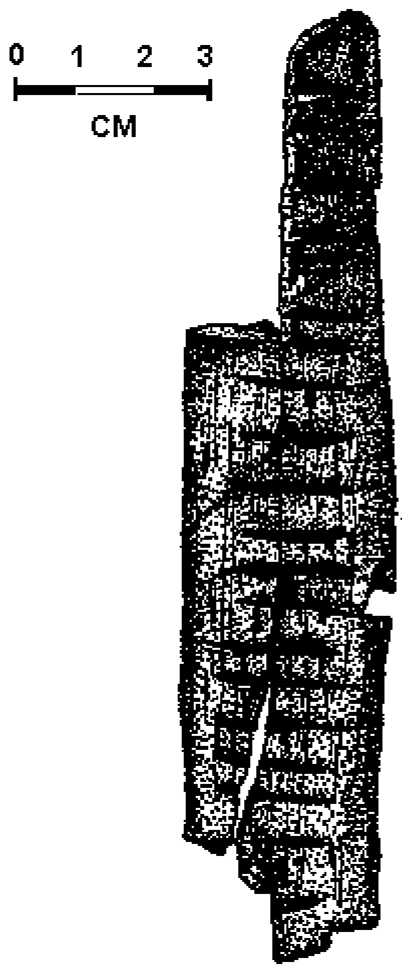


Figure 7.4. Late Preclassic Manatee Bone Rasp: 2003 22:11 (after Scott 1980:319)

Rasps are noted from several sites including Altar de Sacrificios (Willey 1972), Cerros (Garber 1981), Lubaantun (Hammond 1972), Mayapan (Proskouriakoff 1962), Mundo Perdido (Laporte 1998), Piedras Negras (Coe 1959) Seibal (Willey 1978), Tikal (Moholy-Nagy 1994) and Tonina (Becquelin and Taladoire 1990). The Late Preclassic rasp recovered from Op 2003 20:11 is produced from a Manatee rib (Figure 7.4.). Manatee rib rasps are also reported from Lubaantun (Hammond 1975), Seibal (Willey 1978), and from the Yucatan Coast (Eaton 1978).

Table 7.9. Bone Rasps

Prov.	L	D	W	Th	Wt	Context	Comments
Late Preclassic							
2003 22:8	2.50		1.20	0.45		Structure 1	Fragment
2003 22:11	16.00		3.50	2.00	87.54	Structure 1	Manatee rib fragment; 20 parallel grooves
2011 2:4	4.00	4.00	1.50			Unknown	Fragment
Terminal Classic							
2011 5:1	7.18		4.70	2.91	79.38	Midden	Four parallel lines incised; specimen is highly eroded

Possible Shark Vertebrae Ear Flare

This form category is represented by a shark vertebrae that is thought to have functioned as an ear flare (Buttles 1992a; Figure 7.5). The vertebrae for this artifact was probably taken from a shark of considerable size such as the tiger shark. It was recovered from the chest region of Protoclassic burial of an adult female at Op 2031 5/6:110 (Buttles n.d.; Sullivan 1991a; Wright n.d.). The skull was rotated as if looking over the right shoulder which may account for the location of the artifact (Wright n.d.a). It is also possible that it may have functioned as a pendant or hair ornament. This specimen displays a red substance that was also located on the body of the individual. Similar specimens have been reported from Cerros (Garber 1989:55) and Tikal (Moholy-Nagy 1994: Figure 7.2j).

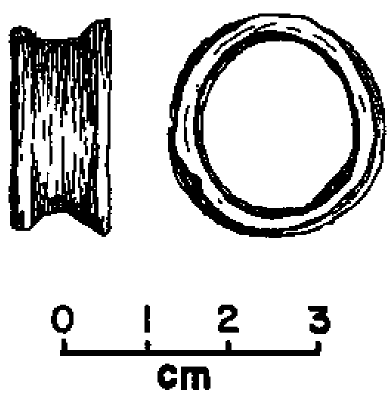


Figure 7.5. Possible Shark Vertebrae Ear Flare (after Buttles 1992a)

Table 7.10. Possible Shark Vertebrae Ear Flare

Prov.	D	Th	Wt	Context	Comments
Protoclassic					
2031 5/6:110	2.45	1.06	1.70	Burial	Edges ground smooth, red substance on surface

Drilled Bone Bar

A single perforated bone bar was recovered from a Late Preclassic burial at Op 2012 B5 (Table 7.11; Potter 1980). According to Shultz (n.d.) the bar was manufactured from a bone splinter that was grooved and perforated. Nine biconical perforations are positioned along the vertical axis of the specimen and one central perforation on the horizontal axis that would have allowed suspension. Associated with this burial also were the anthropomorphic bone beads and disk shell beads. It is possible that the bone and shell beads were suspended from the perforations.

Table 7.11. Perforated Bone Bar

Prov.	L	W	Th	Context	Comments
Late Preclassic					
2012 B5	5.12	0.63	0.45	Burial	Nine biconically drilled holes

Garber (1989:53) reports a similar specimen from construction fill at Cerros. Two drilled bone bars which together functioned as a bracelet were recovered from Burial 167 in the North Acropolis at Tikal (Coe 1965b). Between the two bone bars, were strung several strands of shell disks beads.

Turtle Bone Disks

A turtle bone disk is reported from Op 4001 2/5 (Figure 7.6; Table 7.12). The edges have been ground smooth and a central partial perforation is located on one side. A similar specimen is noted from Seibal (Willey 1978:171). The function of this specimen is unknown.

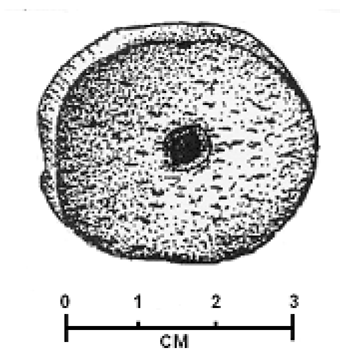


Figure 7.6. Turtle Bone Disk from 4001 2:5 (after Scott 1980:319)

Table 7.12. Turtle Bone Disk

Prov.	D	Th	Wt	Context
Late Classic				
4001 2:5	3.72	1.19	10.85	Construction fill/Midden

Perforated Teeth

The perforated teeth form category is comprised of 13 specimens that have been drilled at the root or tang (Figure 7.6, 7.13 and 7.14). Two subforms, perforated canines and perforated shark teeth are found. Perforated teeth have been typically classified as pendants or adornos and have a wide distribution in the Maya area (Becquelin and Taladoire 1990; Coe 1959; Garber 1981, 1989; Hammond 1991a; Kidder et al. 1946; Lee 1969; Longyear 1952; Pina Chan 1968; Proskouriakoff 1962; Sheets 1978; Sullivan 1997; Thompson 1939; Willey 1972, 1978).

Although it is possible that they may have functioned as pendants, they may have also served as beads for anklets, bracelets, headdresses, or necklaces. Another possible use is that they may have been sewn onto clothing. Teeth worn in mass on the arms, necks, legs, or on clothing could have functioned as noisemakers similar to Olivia shell tinklers. Animal teeth have also been associated with bloodletting rituals (Borhegyi 1961; Schele and Miller 1986). Hayden and Cannon (1984:105) report that in the highland Guatemalan village of Chanal, animal teeth are used as bloodletters.

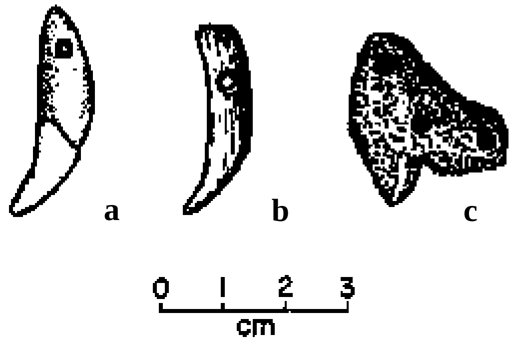


Figure 7.7. Perforated Teeth: a) dog canine (after Shaw 1991:233); b) dog canine 2011 2:4 (after Scott 1980:319); c) shark's tooth

Perforated Canines

Two dog and one feline canine, each with a single perforation comprise, this subform (Table 7.13). All four specimens were derived from midden contexts. One of the dog canines was recovered from an early Middle Preclassic midden at Op 2031 (Figure 7.7a; Shaw 1991a). The second specimen is reported from a Late Preclassic midden at Op 2011 (Figure 7.7b). Perforated dog canines reported from Preclassic contexts are noted at Caracol (Brown 2002, personal communication), Cerros (Garber 1989:53) Chiapa de Corzo (Lee 1969:167), and Seibal (1978:171).

The perforated feline canine was recovered from a Late Preclassic midden at Op 2031. Similar feline canines are reported from Altun Ha (Pendergast 1979:166), Barton Ramie (Willey et al. 1965:502), Copan (Willey et al. 1994:292), and Seibal (Willey 1978:171).

Table 7.13. Perforated Canines

Prov.	W	L	Wt	Species	Context	Comments
early Middle Preclassic						
2031 62	0.58	3.22	1.40	Dog	Midden	Biconical perforation in tang
Late Preclassic						
2011 2:4	0.76	3.04	1.08	Dog	Midden	Biconical perforation in tang
2031 5:100	0.98	3.21	1.42	Feline	Midden	Biconical perforation in tang

Perforated Shark Teeth

A Protoclassic lip-to-lip ceramic cache from Op 2012 14:55 contained a chert blade with human blood residue, shell, greenstone, specular hematite, an unidentified organic substance, and 10 perforated shark teeth (Figure 7.7c; Table 7.14; Potter 1994). The contents of the cache including the teeth exhibit an unidentified red substance. Only two teeth are complete and in a serious state of deterioration which impairs the discovery of the exact number of perforations for each tooth. Those teeth with visible perforations contain a minimum of two and maximum of five perforations.

The teeth have been identified as being from the lower and upper jaws of the Tiger or Leopard shark (*Galeocerdo arcticus*). The Tiger shark is one of the more common sharks in the tropics and often appears close to the shore (Hamblin 1984). According to Hamblin (1984:27), the Tiger shark is strong, active, and dangerous. It typically ranges in size from 13 to 14 feet and weighs between 1,000 and 3,000 pounds. Its aggressive nature and large size probably made it difficult to procure.

Table 7.14. Perforated Shark's Teeth

Prov.	W	L	Wt	Perforations	Context	Comments
Protoclassic						
2012 12:55	2.12	2.14	0.75	2	Cache	Fragmented tang
2012 12:55	2.03	2.13	1.05	2	Cache	
2012 12:55	2.12	2.41	1.24	3	Cache	
2012 12:55	2.12	2.52	1.02	4	Cache	
2012 12:55	2.12	2.11	1.04	2	Cache	Fragmented tang
2012 12:55	1.82	2.00	0.80		Cache	Tang missing
2012 12:55	2.21	2.50	0.50		Cache	Tang missing
2012 12:55	0.85	2.12	0.42		Cache	Tang and portion of tooth missing
2012 12:55	0.88	1.2	0.25		Cache	Tang missing, one perforation can be seen in the tang fragment
2012 12:55	1.04	2.41	0.42		Cache	Tang missing, one perforation can be seen in the tang fragment

Shark teeth are known from other sites in the Maya area including Altun Ha (Pendergast 1979:52), Cerros (Garber 1989), Chalchuapa (Sheets 1978), Chiapa de Corzo (Lee 1969), Cozumel (Hamblin 1984), Cuello (Hammond 1991), Nebaj (Smith and Kidder 1951), Mayapan (Pollock and Ray 1957; Proskouriakoff 1962), Palenque (Ruz 1958), Piedras Negras (Coe 1959), and Tikal (Moholy-Nagy 1994). Shark teeth have also been recovered from the sites of Cerro de las Mesas (Drucker 1943), La Venta (Drucker 1952), and Las Flores (Ekholm 1944).

Unperforated shark teeth have been reported in contexts associated with other ritual bloodletting implements including stingray spines (Borhegyi 1961; Schele and Miller 1986). Borhegyi (1961) reports that sharks have been captured with stingray spines embedded in their jaws. This association may have held significance for the ancient Maya.

Another documented use of perforated sharks' teeth is noted at Chiapa de Corzo. A Protoclassic burial contained 56 shark teeth positioned around the shank area of an obsidian lance (Lee 1969; Lowe and Agrinier 1960:40, 85). Lintels 40 and 41 at Yaxchilan illustrate spear-shafts with lashed spikes around the shank (Graham 1979 Figures 15b-c; Graham and von Euw 1977:111:27). Although it is known that obsidian was used to spike shafts, the Chiapa de Corzo example illustrates that sharks teeth may have also served this purpose. Additional evidence for the use of shark's teeth on weaponry is derived from Panama where Lothrop (1950:14) describes lances that are studded with the teeth of shark and other fish.

How the Colha specimens functioned is unknown. It is clear that they are in direct association with a bloodletting ritual. However, no blood has been detected on the teeth. It is possible that the teeth may have been strung and worn as suggested by Potter (1994). They may have also functioned in a similar capacity as the examples from Chiapa de Corzo with the wooden shaft being broken and placed into the cache as part of the ritual.

Tapered Bone Objects

Traditionally, three types of tapered bone objects have been recognized, pins, needles, and awls or punches. This analysis treats each of these types (of tapered objects) as a subform of the form category of tapered bone objects. The rational behind this decision is based on the inability to assign distal, medial, and proximal fragments to a form category unless diagnostic features such as eyes are present. When the distal tips of complete pins and needles are examined, they often appear identical in morphology. Proximal ends of many complete pins and awls are also often identical. Therefore, as reasoned above, this form category is comprised of four subforms, pins, needles, awls, and fragments (Figure 7.8). Only complete specimens or those that at a minimum retain their distal and medial or medial and proximal sections are assigned to one of the three functional subform categories. The remaining fragments are addressed under the subform of fragments.

Tapered bone objects are thought to have been produced by percussion shattering or by transverse and longitudinal grooving and snapping (Shaw 1991a). The resulting bone fragments or splinters where then shaped through a series of processes which probably included one or all of the following: abrading, carving, grinding, or shaving. The final form probably dictated the techniques applied for shaping.

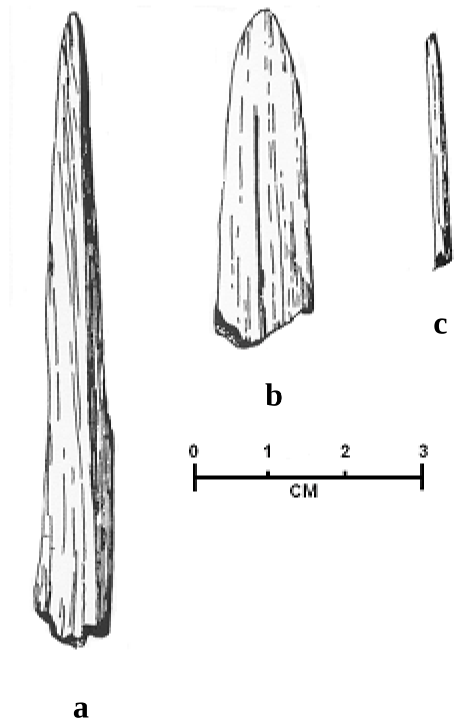


Figure 7.8. Tapered Bone Objects: a) awl, 2010 1:6; b) distal fragment 2010 1:2; c) needle fragment 2012 2:3 (after Scott 1980:319)

Tapered Bone Objects: Pins

A bone pin is defined as any specimen that has a wide proximal end that tapers to a pointed distal section. The tapered section tends to be slightly rounded to slightly squared while the proximal or butt end retains more of the natural bone curvature. The entire specimen displays ground and smoothed edges.

A total of 11 bone pins were recovered from midden (n=7), burial (n=3) and ceramic lined fire pit (n=1) contexts (Table 7.15). Bone pins are suggested to have functioned as tools in textile production and as hair or clothing ornaments (see Hendon 1997; Willey 1972). When recovered from burial contexts it is possible that they may have functioned as means of securing fabric or perishable materials to human internments as part of body bundling. Thus, it seems highly likely that this artifact form was multi-functional. Bone artifacts classified as pins are reported of varying width, thickness, and morphology (Garber 1989; Hammond 1975; Laporte 1998; Willey 1972, 1978). It is quite possibly that variations in pin morphology may reflect functional differences.

Only two complete specimens are reported from Colha. Both pins were recovered from a Late Preclassic burial context at Op. 2012 (Potter 1981). Their position within the burial is currently unknown. The Colha specimens are similar in form to those reported from Altar de Sacrificios (1972), Cerros (Garber 1989), Copan (Hendon 1997; Willey et al. 1994), and Seibal (Willey 1978). Willey (1972:236) reports a Preclassic pin that is pointed at both ends as well as Late Classic pins that have been engraved with a sequence of glyphs. At Altun Ha, two elaborately carved and incised bone pins with glyphs were recovered from the Sun God's tomb (Pendergast 1969:19).

Table 7.15. Tapered Bone Objects: Pins

Prov.	L	Max/ Min W	Max/Min Th	Context	Comments
early Middle Preclassic					
2031 3:38A	13.19	1.21/0.56	0.71/0.39	Midden containing burials	Light polish; specimen is in two piece
late Middle Preclassic					
2011 2:4	9.58	0.85/0.56	0.47/0.40	Midden like construction fill	Light Polish
Late Preclassic					
2003 22:8	2.24	0.68/0.54	0.35/0.32	Midden	Heavily burned; tip missing; highly burned and polished (from burning?)
2012 2:2FI	0.95	0.62/0.54	0.62/0.62	Ceramic lined fire pit	Distal to medial fragment, tip missing
2012 5:B5	9.70	0.93/0.28	0.70/0.70	Burial	Light Polish; reconstructable pin; edges ground smooth and slightly rounded; tapered; portion of epiphyseal present
2012 5:B5	12.10	1.28/0.24	0.70/0.70	Burial	Light Polish
2012 5:B5	1.68		0.28/0.28	Burial	Light Polish
Terminal Classic					
2037 1:10	7.41	0.77	0.44/0.44	Midden	Medium Polish
Early Postclassic					
2037 1:8	2.18	0.32	0.34/0.34	Midden	Medium Polish
Middle Postclassic					
2010 1:2	7.58	0.54/0.33	0.37.0.29	Midden	Medium Polish
2010 1:6	8.74	1.08/0.48	0.80/0.37	Midden	Medium Polish; distal and medial section

Tapered Bone Objects: Needles

Three bone needles were excavated from Postclassic midden contexts at Op 2037 (Table 7.16; Michaels and Shafer 1994). A bone needle is specifically defined by the existence of an eye. The body of the Colha bone needles tend to be ground smooth, slightly rounded, and taper to a point at the distal end. The thickness and width of the needles is relatively small.

Table 7.16. Tapered Bone Objects: Needles

Prov.	L	Max/ Min Th	Context	Comments
Early Postclassic				
2037 1:8	10.18	0.35/0.19	Midden	Light polish; complete but in two pieces
2037 1:8	7.87	0.39/0.23	Midden	Medium polish; complete
Middle Postclassic				
2037 1:4	5.02	0.23/0.16	Midden	Light polish; fragment with eye

Needles are thought to have functioned in a fashion similar to modern day needles. Three are reported from the Sun God's tomb at Altun Ha (Pendergast 1969:18). The needles were positioned away from the body and in close proximity to the two carved and incised bone pins. Hayden and Cannon (1985: 89) report similar needles that are currently in use in the highlands of Guatemala. Bone needles are reported from Altar de Sacrificios (Willey 1972), Altun Ha (Pendergast 1969), Copan (Hendon 1997), Dolores (Eaton 1978), Lubaantun (Hammond 1975), and Tonina (Becquelin and Taladoire 1990).

As with bone pins, bone needles are reported in a variety of length, widths, and thickness. The overall form may relate to the type of material being worked, again, similar to the modern day needle. It is also possible that needles may have been reworked when the head was broken, thus resulting in a reduction in size with extended use.

Pointed Bone Objects: Awls

Three pointed bone objects recovered from midden contexts have been classified as bone awls (Table 7.17). Each is represented by a medial and proximal section. The Colha bone awl assemblage is similar in form to pins (wide proximal end that taper) but with a greater width and rounded to slightly pointed distal tips. The natural curvature of the bone is present on the majority of proximal fragments. The distal sections appear to be more ground than the medial and proximal sections. The entire specimen displays ground and smooth edges.

Table 7.17. Pointed Bone Objects: Awls

Prov.	**L**	**Max/ Min W**	**Max/Min Th**	**Context**	**Comments**
Protoclassic					
2031 3:25	5.87	0.74/0.64	0.52/0.36	Midden	Light polish; edges slightly ground; rounded tip intact
Early Postclassic					
2010 1:10	7.89	1.21/0.89	0.71/0.65	Midden	Light polish; edges slightly ground; rounded tip intact
2010 1:10	7.41	0.78/0.32	0.45/0.28	Midden	Light polish; edges slight ground; tip is missing

Bone awls are thought to have functioned as a perforators/punches and weaving tools (Willey 1972, 1978). This artifact type is reported from a variety of contexts throughout the Maya area (cf. Bullard and Bullard 1965; Garber 1981, 1989; Kidder 1947; Kidder et al. 1946; Lee 1969; Longyear 1952; Proskouriakoff 1962; Sheets 1978; Willey et al. 1965, 1994; Willey 1972, 1978)

Ethnographic data from the highlands of Guatemala report similar bone artifacts in use as corn huskers, also referred to as tapiscadores (Hayden and Cannon 1984:83, Figure 28). On several occasion, the author has witnessed similar bone tools being used in the production of textiles in the highlands of Guatemala. It is most probable that this artifact form is multifunctional. According to Hayden and Cannon (1984:85) the use-life of tapiscadores varies. Specimens made from wood are often discarded after a single harvesting season, whereas those made from bone are often curated for several generations. They further note that in reality the bone specimens tend to be lost after two to five seasons.

Tapered Bone Objects: Fragments

This category is comprised of distal, proximal, and medial sections or pieces of pins, needles, or awls. However, their incompleteness precludes them from being assigned to a complete form category. A total of 10 specimens are reported from midden (n=9) and construction related (n=1) contexts (Table 7.18).

Table 7.18. Tapered Bone Objects: Fragments

Prov.	L	W	Th	Section	Context	Comments
Late Classic						
2008 12:2	3.39	0.65	0.50	Distal	Construction fill	Possible pin fragment
Middle Postclassic						
2010 1:1	4.11	0.77	0.35	Distal	Midden	Possible pin fragment
2010 1:1	2.99	1.06	0.79	Medial	Midden	
2010 1:2	4.57	0.89	0.45	Medial	Midden	Possible pin fragment
2010 1:2	3.65	1.28	0.48	Medial	Midden	
2010 1:2	3.33	0.77	0.34	Distal	Midden	
2010 1:4	2.87	1.75	0.42	Medial	Midden	
2010 1:6	4.04	1.14	0.46	Medial	Midden	
2010 2:2	4.27	0.64	0.42	Distal	Midden	
2010 2:2	3.31	0.42	0.32	Distal	Midden	

CONTEXTUAL PATTERNS AND TRENDS

At Colha, a total of 165 bone artifacts are reported from early Middle Preclassic to Middle Postclassic contexts (Table 7.19). The majority, n=125 or 75.7%, were derived from Preclassic contexts. Within the Preclassic, the Late Preclassic accounts for 35.5% of the Preclassic assemblage. The Classic period is highly under represented and accounts for only 1.0% of the assemblage. The Postclassic fares better with (n=22) 13.3% of the total assemblage. The majority of the Postclassic assemblage, n=17 or 77.2%, was derived from Middle Postclassic deposits.

Table 7.19. Temporal Distribution of Bone Artifacts

Artifacts		Temporal Data								
Artifact Form	**Subform**	**eMP**	**lMP**	**LPC**	**PRC**	**LC**	**TC**	**EPC**	**MPC**	**Unknown**
Beads										
	Anthropomorphic	1		32						
	Tubular	1	6	2						1
	Barrel		26							
	Peanut		2							1
	Fish Vertebrae	1	5			11	1		4	
Tubes										
	Plain	9	1	8					1	
	Decorated		1	2						
	Perforated and Decorated			2						
Rasp				3			1			
Ear Ornament					1					
Drilled Bone Bar				1						
Disk						1				
Perforated Teeth	*Canines*	1		2						
	Shark				10					
Pointed Bone Objects										
	Pins	1	1	5			1	1	2	
	Needles							2	1	
	Awls				1			2		
	Fragments					1			9	
TOTAL		**14**	**42**	**57**	**12**	**13**	**3**	**5**	**17**	**2**

Table 7.20. Contextual Distribution of Bone Artifacts

Artifacts		Contextual Data					
Form	**Subform**	**Burial**	**Cache**	**Midden**	**Construction fill**	**Fire pit**	**Unknown**
Beads							
	Anthropomorphic	32			1		
	Tubular	6		1	2		1
	Barrel	25			1		
	Peanut	2					1
	Fish Vertebrae			4	18		
Tubes							
	Plain	2		3	1		13
	Decorated	2		1			
	Perforated and Decorated			2			
Rasp				1	2		1
Ear Ornament		1					
Drilled Bone Bar		1					
Disk					1		
Perforated Teeth	*Canines*			3			
	Shark		10				
Pointed Bone Objects							
	Pins	3		7		1	
	Needles			3			
	Awls			3			
	Fragments			9	1		
TOTAL		**74**	**10**	**37**	**27**	**1**	**16**

The majority of bone artifacts, n=74 or 44.8%, were recovered from burial contexts (Table 7.20). Only one cache deposit contained bone artifacts in the form of shark's teeth. A total of 22.4% of the bone assemblage was associated with midden deposits. Construction related contexts account for 16.3% of the assemblage.

Beads (n=94) are the most prevalent bone artifact form at Colha. Of the 94 beads, the majority, n=65 or 69.1%, were recovered from early Middle Preclassic and late Middle Preclassic burials at Op 2012. The beads were found in association with the disk shell beads and together probably functioned as anklets or bracelets.

All bone artifacts from burial contexts are reported from Op 2012 (Potter 1980, 1981). Only Preclassic burials are represented, no bone artifacts are reported from Classic or Postclassic burials. The Late Preclassic burial (2012:B5) contained 36 bone artifacts including the drilled bone bar, 32 anthropomorphic beads, three pins, and shell artifacts (Potter 1981:110). Two additional Late Preclassic burials (2012 3:B2, 2012 3:B3) each contained one plain and one carved and incised bone tube (Potter 1980:179). The fact that all three Late Preclassic associated burials at Op 2012 contained bone artifacts is probably significant, but its exact significance remains elusive.

CHAPTER 8

RAW MATERIAL: STONE

POLISHED STONE AND GROUND STONE ARTIFACTS

This raw material category is comprised of 151 artifacts produced from stone. Stone tools and utilitarian ground stone implements (mano and metates) will not be considered here. Three types of stone are represented, greenstone, limestone, and slate. The only locally available stone at Colha is limestone and chert. Greenstone and slate would have been imported most likely in finished artifact forms. The non-locally derived stones reflect different procurement strategies and sources and will therefore be discussed in brief prior to the presentation of the artifacts. Because different production technologies are represented, the artifacts are presented in two sections according to the technology applied in the creation of the finished form, polished stone and ground stone.

NON-LOCALLY DERIVED STONE

Presented here is a brief review of the non-locally derived stone represented in the Colha stone artifact assemblage. This review, although not exhaustive, is intended to illustrate that the acquisition of these materials would have required participation in a system(s) of exchange or trade.

Greenstone

The term jade or jadeite is most often used to describe artifacts produced from stone that is green. True jadeite can only be identified through trace element analysis (Harlow 1993). The term greenstone is used here to describe all artifacts that would typically fall under the category of “jades" as no source analysis was attempted. In the Maya area the term “social jade” has been adopted to describe artifacts produced from greenstone whose function is the same as those produced from jadeites (Hammond et al. 1977:61).

Jadeite is a sodium aluminum silicate mineral in the pyrozene family that is considered a hard, durable stone, and occurs in a variety of colors and textures (Chenault 1988:92; Harlow 1993:13). Forming along side of jadeite is another common greenstone, serpentine, however it is much softer. Other greenstones or “social jades” utilized in the Maya include soapstone, albitite, cryptocrystalline quartz, quartzites, and undetermined stones (Harlow 1993:10).

The only documented source of jadeite is in the northern metamorphic highlands of Guatemala and, in particular, the Motagua Valley (see Walker1982). Much debate has been made regarding additional sources (see Bishop 1993; Lange and Bishop 1988; Mora-Marín 1999). Dunham (1996:328) reports finding non-jadeite greenstone as floats in the Maya Mountains of Belize. However, comparisons with greenstone curated in the Department of Archaeology in Belmopan revealed no material matches with the Maya Mountains materials.

At Colha, color hues ranging from light, medium, to dark green are found. Specific descriptive colors include aqua green, bright apple green, blue-green, gray-green, and a fuschite like material. Several specimens, including the fuschite like material are mottled with a variety of green hues represented. Physical comparisons with greenstone from sites in the Maya area suggest that the Colha assemblage is comparable.

Greenstone has long been recognized as a raw material of significant value throughout Mesoamerica (Adams 1991; Digby 1964; Garber 1989; Hammond et al. 1977; Hammond 1991b; Lange and Bishop 1988; Thompson 1950; Thomson 1987). It has been suggested that within the Prehispanic Mesoamerica area different varieties of "jade" were acknowledged based on color, quality, and level of workmanship investment (Lange 1986 in Chenault 1988:106). Jade's importance in the Mesoamerican region begins during the Early Preclassic and continued up to the contact period. By the contact period, the Maya had five different terms for "jade" based on color and quality (Mora-Marín 1999:25).

Artifacts produced from greenstone were manufactured through a series of production techniques and would have included cutting, drilling, grinding, incising, pecking, sawing, and polishing (see Chenault 1988; Kidder et al. 1946:117-124; Widmer 1991). Degree of stone hardness probably affected the production techniques applied. At Colha there exists no evidence for the production of greenstone except for the possibility of recycled greenstone artifacts. However, Widmer (1991) reports that production waste is so small that normal excavation strategies would not detect this type of activity.

Slate

The exposed formations of the Maya Mountains of Belize are a source for slate (Dixon 1956:8-9; Dunham 1996). In the Belize Valley, slate was used prehistorically as building material and for the production of artifacts (Graham 1994:12). Slate is still quarried and utilized by the modern-day inhabitants of Belize for the production of materials for the tourist market. Slate is also known to occur in the northern metamorphic highlands of Guatemala.

POLISHED STONE

Included here are 139 portable objects produced from stone that have been intentionally polished as the final step in their production cycle. Although it is recognized that additional processes of cutting, grinding, pecking, and sawing were probably utilized in their creation, it is this final step of polishing that distinguishes this category of artifacts from other ground stone artifacts such as manos and metates (Sheets 1978).

Of the polished stone assemblage only one is not manufactured in greenstone. Included are five form categories beads, celts, ear ornaments, pendants, and miscellaneous. Subforms are also represented and discussed below.

Because of the subtractive nature of the production process, slight variations in form and subform categories are found.

Polished Stone Beads

Polished stone beads account for the majority (n=118 or 78.1%) of polished stone artifacts recovered from Colha (Figure 8.1). All are produced from greenstones. The perforations that enabled suspensions or stringing were all obtained through biconical drilling. Within the polished stone bead form category are found the subforms of subspherical, tubular, barrel, disk, rectangular, triangular, and miscellaneous fragments. Fragments whose complete form could be determined were ascribed to the appropriate subform category. All others are addressed under the miscellaneous bead fragments subform. Several Colha beads are curated in the Department of Archaeology in Belmopan, Belize, but were not available for examination. Data for these specimens were obtained from field notes and photographs.

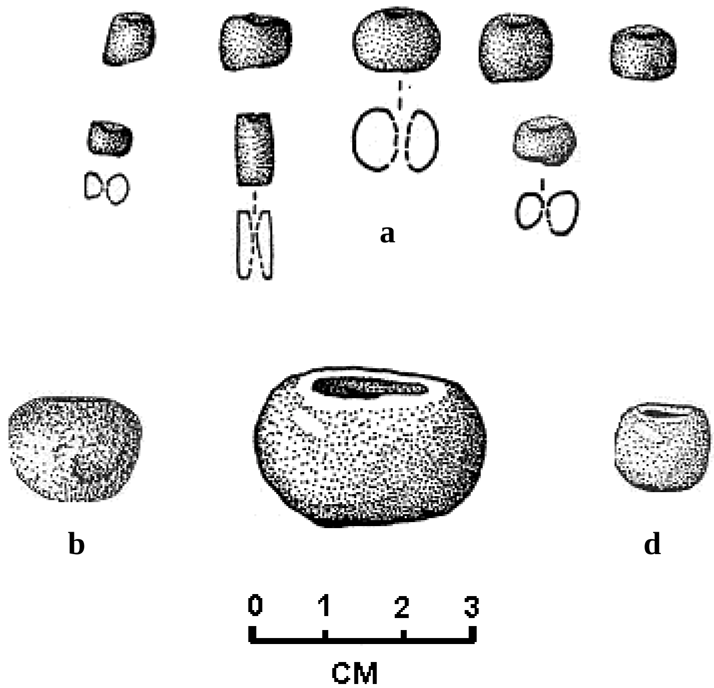


Figure 8.1. Polished Greenstone Beads: a) beads from the Late Preclassic ballcourt cache at Op 2009 (after Eaton and Kunstler 1980:127); b) subspherical bead from a Protoclassic burial at op 2031 5-6:110 (after Buttles 1992a:141); c-d) subspherical beads from the Protoclassic bloodletting cache at Op 2012 14:55 (after Hester 1983:15).

The polished greenstone bead subforms excavated at Colha are in keeping with those reported from sites in the Maya area (cf. Garber 1989; Hammond 1975, 1991a; Kidder 1947, 1951; Lee 1969; Moholy-Nagy 1994; Pendergast 1979; Willey 1972, 1978; Willey et al. 1994). An excellent example of the use of greenstone beads was recovered from Burial 196 at Tikal where a mosaic jade vessel portrayed a female wearing a composite greenstone bead necklace and ear ornaments (Harrison 2000:135). Other examples of the use of greenstone beads are found at Tikal's Temple 2, Lintel 2, and Burials 92 and 116 (Harrison 2000:Figures 83,84,99). Here the beads are depicted as being part of composite necklaces, bracelets, anklets, and waistbands. However, it should be noted the majority of these examples illustrate high ranking individuals in elaborate regalia. Greenstone beads recovered from small sites although functioning as adornments and symbols of status were probably not equivalent to the elaborate composite regalia of the individuals from sites such as Tikal.

Polished Stone Beads: Subspherical

A subspherical bead is defined by rounded beads whose thickness is less than their diameter. A total of 24 subspherical beads were recovered from cache (n=18), burial (n=1), midden (n=2), construction related (n=2), and unknown (n=1) contexts at Colha (Table 8.1). This subform is common throughout the Maya area (cf. Adams 1999; Awe 1992; Becquelin and Taladoire 1990; Coe 1959; Garber 1989; Hall 1987; Hammond 1975, 1991b; Kidder et al. 1946; Longyear 1952; Moholy-Nagy 1994; Pendergast 1969, 1979; Sullivan 1997; Willey et al. 1965; 1994; Willey 1972, 1978).

Table 8.1. Polished Stone Beads: Subspherical

Prov.	D	Th	Wt	Color	Context	Comments
Late Preclassic						
2009					Ball Court Cache	Curated DOA Belize
2009					Ball Court Cache	Curated DOA Belize
2009					Ball Court Cache	Curated DOA Belize
2009					Ball Court Cache	Curated DOA Belize
2009					Ball Court Cache	Curated DOA Belize
2012 14:30	48.00	3.80	85.87	Light to medium mottled green	Cache	Highly polished
2012 14:30	1.60	1.50	3.80	Light green	Cache	Medium to highly polish
2012 14:29	1.63	1.44	3.67	Light green	Cache	Highly polished
2012 14:29	1.44	0.69	1.40	Light green	Cache	Highly polished
2031 3:14	0.80	0.40		Light green with band of tan and green	Cache	Lightly polish fragment; represents one-half of bead
2031 7:86	1.77	1.35	5.73	Light to medium mottled green	Cache	Lightly polished to dull fragment; represents one-half of bead
Protoclassic						
2012 14:55	1.50	1.00	3.10	Medium to light green	Cache	Lightly polished to dull
2012 14:55	0.94	0.73	1.10	Light to bright apple green	Cache	Highly polished
2012 14:55	1.20	0.78	1.50	Medium green	Cache	Lightly polished
2012 14:55	0.90	0.60	0.80	Medium green	Cache	Lightly polished

Table 8.1. Polished Stone Beads: Subspherical (continued)

Prov.	D	Th	Wt	Color	Context	Comments
2012 14:55	3.50	2.20	26.00	Dark to light mottled green, small patches of bright apple green	Cache	Medium to highly polished
2012 14:55	2.10	2.00	19.02	Medium to light green, with patches of dark green and bright apple green	Cache	Medium to highly polished
2012 14:55	2.00	2.00	19.00	Light to medium green with patches of bright apple green	Cache	Highly polished; bead was found in four fragments, reconstructable
2031 5:81	2.99	2.65	13.43	Light to medium green	Construction material	Medium polish; fragment, one-half of bead
2031 5:81		1.95	4.78	Light to medium green	Construction material	Medium polish; fragment, one-half of bead
2031 5-6/110	2.30	1.20	14.00	Light to medium green with patches of bright apple green	Burial, adult female	Medium polish
Middle Postclassic						
2032 2:2	1.23	0.97	2.15	Greenish black with specs of light green	Midden	Medium polish
2032 4:2	0.81	0.56	0.53	Light to medium mottled green	Midden	Medium polish

Table 8.1. Polished Stone Beads: Subspherical (continued)

Prov.	D	Th	Wt	Color	Context	Comments
Unknown						
2012 8:2	2.47	1.95	18.51	Light to medium mottled green	Unknown	Medium polish

Polished Stone Beads: Tubular

The tubular bead has a length greater than its diameter and straight parallel sides. At Colha a total of 31 tubular beads manufactured from greenstone have been recovered from burial (n=20), cache (n=10), and midden (n=1) contexts (Table 8.2). As with the subspherical subform, the tubular subform is also depicted on stela and lintels as part of elaborate personal adornment and is reported throughout the Maya area (Garber 1989; Hammond 1975, 1991b; Harrison 2000; Kidder 1947,1951; Lee 1969; Moholy-Nagy 1994; Pendergast 1979; Robichaux 1998; Sheets 1978; Smith and Kidder 1947; Willey 1972; Willey et al. 1994). Of special note is the use of this form in composite ear ornaments as seen on the mosaic greenstone vessel from Tikal (Harrison 2000:135). An illustrated example of a composite ear plug assemblage is found in Kidder (1951:38).

Table 8.2. Polished Stone Beads: Tubular

Prov.	D	Th	Wt	Color	Context	Comments
early Middle Preclassic						
2012 12:61	2.40	0.86	0.34	Dark dull translucent green	Burial, adult	Light polish, recovered near cranium
Late Preclassic						
2009					Ball Court Cache	Curated DOA Belize
2009					Ball Court Cache	Curated DOA Belize
2012 12:51	0.79	0.38	0.20	Light to medium green; fuschite like material	Burial, infant	Light polish; also recovered two whole modified shells and shell effigy vessel
2012 12:51	0.42	0.32	0.20	Light to medium green; fuschite like material	Burial, infant	Light polish; also recovered two whole modified shells and shell effigy vessel
2012 12:51	0.35	0.79	0.20	Dark green; fuschite like material	Burial, infant	Light polish; also recovered two whole modified shells and shell effigy vessel
2012 13:29	5.82	1.33	1.93	Light to medium mottled green; fuschite like material	Cache	Heavy polish
2012 13:29	3.81	1.61	16.16	Light grayish green; fuschite like material	Cache	Medium polish; fragment; two other fragmented pieces from this lot are matching in color
2012 14:29	1.85	1.35	2.44	Light grayish green; fuschite like material	Cache	Medium polish; fragment

Table 8.2. Polished Stone Beads: Tubular (continued)

Prov.	D	Th	Wt	Color	Context	Comments
2012 14:30	5.80	1.30	19.20	Light to medium mottled green; fuschite like material	Cache	Heavy polish
2012 14:30	3.90	1.10	16.20	Mottled white and grayish green	Cache	Heavy polish
Protoclassic						
2012 12:34	0.77	0.50	0.42	Dark green; fuschite like material	Burial	Medium polish; fragment
2012 14:55	1.46	0.52	1.08	Medium green	Cache	Heavy polish
2012 14:55	1.24	0.60	0.80	Light green	Cache	Medium polish
2012 14:55	1.30	1.10	6.10	Medium to light mottled green	Cache	Heavy polish
2031 5-6:110	3.30	0.70	3.00	Light to medium green and aqua green; fuschite like material	Burial, adult female	Medium polish; recovered from chest region
2031 5-6:110	2.30	0.80	3.20	Light to medium green and aqua green; fuschite like material	Burial, adult female	Medium polish; recovered from chest region
2031 5-6:110	2.00	0.55	1.20	Light to medium green and aqua green; fuschite like material	Burial, adult female	Medium polish; recovered from chest region

Table 8.2. Polished Stone Beads: Tubular (continued)

Prov.	D	Th	Wt	Color	Context	Comments
2031 5-6:110	2.80	0.65	2.30	Light to medium green and aqua green; fuschite like material	Burial, adult female	Medium polish; recovered from chest region
2031 5-6:110	2.90	0.70	2.30	Light to medium green and aqua green; fuschite like material	Burial, adult female	Medium polish; recovered from chest region
2031 5-6:110	2.70	0.75	2.90	Light to medium green and aqua green; fuschite like material	Burial, adult female	Medium polish; recovered from chest region
2031 5-6:110	2.30	0.75	2.20	Light to medium green and aqua green; fuschite like material	Burial, adult female	Medium polish; recovered from chest region
2031 5-6:110	3.20	0.67	3.10	Light to medium green and aqua green; fuschite like material	Burial, adult female	Medium polish; recovered from chest region
2031 5-6:110	1.80	0.85	2.00	Light to medium green and aqua green; fuschite like material	Burial, adult female	Medium polish; recovered from chest region
2031 5-6:110	3.20	0.83	4.40	Light to medium green and aqua green; fuschite like material	Burial, adult female	Medium polish; recovered from chest region

Table 8.2. Polished Stone Beads: Tubular (continued)

Prov.	D	Th	Wt	Color	Context	Comments
2031 5-6:110	2.00	0.70	1.90	Light to medium green and aqua green; fuschite like material	Burial, adult female	Medium polish; recovered from chest region
2031 5-6:110	3.10	0.70	2.80	Light to medium green and aqua green; fuschite like material	Burial, adult female	Medium polish; recovered from chest region
2031 5-6:110	2.40	0.70	2.00	Light to medium green and aqua green; fuschite like material	Burial, adult female	Medium polish; recovered from chest region
2031 5-6:110	2.10	0.66	2.20	Light to medium green and aqua green; fuschite like material	Burial, adult female	Medium polish; recovered from chest region
2031 5-6:110				Light to medium green and aqua green; fuschite like material	Burial, adult female	Medium polish; fragment
Early Postclassic						
2012 12:12	1.16	0.68	0.90	Medium to dark mottled green	Midden	Heavy polish

Polished Stone Beads: Barrel

Barrel shaped beads have a length greater than their diameter and taper at both ends. A total of 15 barrel beads were recovered from burial (n=10), cache (n=3) and midden (n=2) contexts at Colha (Table 8.3). The barrel bead is a greenstone bead form common to the Maya area (Garber 1989; Hammond 1975, 1991b; Kidder 1951; Lee 1969; Moholy-Nagy 1994; Sheets 1978; Willey 1972, 1978; Willey et al. 1994). This bead form is also depicted on carved monuments and ceramic vessels as personal adornment.

Table 8.3. Polished Stone Beads: Barrel

Prov.	D	Th	Wt	Color	Context	Comments
Late Preclassic						
2012 12:23	0.85	0.70	0.75	Light green; fuschite like material	Burial	Light polish
2012 12:51	0.85	0.50	0.30	Dark green; fuschite like material	Burial, infant	Light polish
2012 12:51	0.75	0.45	0.20	Dark green; fuschite like material	Burial, infant	Light polish
2012 12:51	0.70	0.40	0.05	Dark green; fuschite like material	Burial, infant	Light polish
2012 12:51	0.65	0.45	0.20	Dark green; fuschite like material	Burial, infant	Light polish
2012 12:51	0.86	0.43	0.22	Dark green; fuschite like material	Burial, infant	Light polish
2012 12:51	0.73	0.40	0.20	Dark green; fuschite like material	Burial, infant	Light polish
2012 12:51	0.65	0.40	0.20	Dark green; fuschite like material	Burial, infant	Light polish

Table 8.3. Polished Stone Beads: Barrel (continued)

Prov.	D	Th	Wt	Color	Context	Comments
2012 12:51	0.55	0.45	0.20	Dark green; fuschite like material	Burial, infant	Light polish
2012 14:30	0.45	0.67	0.40	Light green with patches of bright apple green	Cache	Light polish
2031 3:25	0.70	0.70		Medium green	Midden	Light polish
Protoclassic						
2012 12:25	1.17		0.64	Light green	Burial	Heavy polish; fragment one-half of specimen
2012 14:55	0.83	0.45	0.20	Dark green	Cache	
2012 14:55	0.75	0.50	0.20	Light to medium green; fuschite like material	Cache	
Middle Postclassic						
2037 1:2	2.00	1.44	0.87	1.75	Midden	Light polish

Polished Stone Beads: Disk

Disk beads at Colha are defined as those with a diameter greater than the drill hole and are distinguish from tubular beads by a much decreased thickness. The 26 Colha disk beads were recovered from burial (n=18), cache (n=5), unknown (n=2), and construction related (n=1) contexts (Table 8.4). As with the other greenstone bead subforms, the disk bead is reported throughout the Maya area (cf.

Awe 1992; Coe 1959; Garber 1989; Hammond 1991b; Kidder 1947, 1951; Lee 1969; Moholy-Nagy 1994; Sheets 1978; Willey 1972, 1978; Willey et al. 1994).

Table 8.4. Polished Stone Beads: Disk

Prov.	D	Th	Wt	Color	Context	Comments
late Middle Preclassic						
2012 12:61	0.53	0.40	0.20	Medium to light green	Burial, adult	Light polish, recovered near cranium
2012 12:61	0.60	0.35	0.20	Light green; fuschite like material	Burial, adult	Light polish, recovered near cranium
2012 12:73	0.95	0.40	0.70	Medium green; fuschite like material	Burial, young adult	Light polish
2031 6:127	1.30	1.10	0.30	Medium green; fuschite like material	Burial, young adult male	Medium polish
Late Preclassic						
2009					Ball Court cache	
2012 12:51	0.45	0.33	0.18	Dark green; fuschite like material	Burial, infant	Light polish
2012 12:52	0.80	0.44	0.40	Bright apple green	Burial	Light polish
2012 14:104	0.35	0.20	0.18	Light aqua green; fuschite like material	Burial	Medium polish
2012 14:104	0.34	0.17	0.15	Light aqua green; fuschite like material	Burial	Medium polish
2031 3:14	0.80	0.40	0.43	Light green with a band of cream	Cache	Heavy polish
2031 6:215	0.50	0.31	0.13	Light to medium mottled green	Mass burial	Light polish
2031 7:108	1.20	0.45	1.09	Light to medium green; fuschite like material	Construction Material	Medium polish

Table 8.4. Polished Stone Beads: Disk (continued)

Prov.	D	Th	Wt	Color	Context	Comments
Protoclassic						
2012 12:24	1.30	0.70	1.60	Light mottled green	Cache	Heavy polish
2012 12:25	0.67	0.40	0.60	Medium green; fuschite like material	Burial	Light polish
2012 12:25	0.63	0.35	0.61	Light dull green	Burial	Light polish
2012 12:25	0.79	0.43	0.44	Bright apple green	Burial	Medium polish
2012 12:26	1.30	0.71	1.94	Light green	Cache	Heavy polish
2012 14:34	0.45	0.34	0.11	Medium green; fuschite like material	Burial	Heavy polish
2012 14:55	0.63	0.40	0.20	Medium green; fuschite like material	Cache	Medium polish
2031 5-6:110	0.41	0.25	0.10	Medium green to aqua green; fuschite like material	Burial, adult female	Medium polish; recovered from chest region
2031 5-6:110	0.55	0.30	0.20	Medium green to aqua green; fuschite like material	Burial, adult female	Medium polish; recovered from chest region
2031 5-6:110	0.60	0.40	0.20	Medium green to aqua green; fuschite like material	Burial, adult female	Medium polish; recovered from chest region
2031 5-6:110	0.55	0.25	0.20	Medium green to aqua green; fuschite like material	Burial, adult female	Medium polish; recovered from chest region
2031 5-6:110	0.64	0.23	0.20	Medium green to aqua green; fuschite like material	Burial, adult female	Medium polish; recovered from chest region
Late Classic						
4044 1:3	0.70	0.40	0.35	Medium green	Test pit	Light polish

Table 8.4. Polished Stone Beads: Disk (continued)

Prov.	D	Th	Wt	Color	Context	Comments
Unknown						
?	0.70	0.52	0.53	Light green to apple green mottled	Unknown	Light polish

Polished Stone Beads: Rectangular

This stone bead subform is comprised of a single example, rectangular in form with a centrally located perforation (Table 8.5). Its context is problematic in that it was recovered from the screened back dirt of a late Middle Preclassic burial at Op 2031 6:215 (Sullivan 1991a). It was most likely associated with the burial. Similar perforated rectangular greenstone beads are reported from Altar de Sacrificios (Willey 1972:128), Cerros (Garber 1989:39), and Chiapa de Corzo (Lee 1969).

Table 8.5. Polished Stone Beads: Rectangular

Prov.	L	W	Th	Wt	Color	Context	Comments
late Middle Preclassic							
2031 6:215	0.45	0.57	0.31	0.12	Light green; fuschite like material	Burial, adult	Medium polish

Polished Stone Beads: Triangular

A single triangular polished stone bead with a centrally positioned perforation was recovered from an unknown context at Op 2012 (Table 8.6). No reference to triangular beads has been found.

Table 8.6. Polished Stone Beads: Triangular

Prov.	L	W	Th	Wt	Color	Context	Comments
Unknown							
2012	0.88	0.77	0.60	0.52	Medium to light green; fuschite like material	Burial, adult	Medium polish

Polished Stone Beads: Miscellaneous Fragments

This subform category is comprised of 20 small fragments of greenstone beads recovered from cache (n=13), burial (n=3), midden (n=2), and construction related (n=2) contexts (Table 8.7). Refits were attempted with the fragments from the Late Preclassic lots 2012 14:29 and 2012 14:30 to the partially fragmented specimens also from these lots. However, no fragments were found that could be cojoined. Because of their small size the only metric data provided is weight.

Table 8.7. Polished Stone Beads: Miscellaneous Fragments

Prov.	Wt	Color	Context	Comments
late Middle Preclassic				
2031 7:173	0.40	Light green	Construction material	Medium polish
Late Preclassic				
2012 14:29	0.83	Medium to light mottled green	Cache	Medium polish
2012 14:29	0.46	Light grayish green; fuschite like material	Cache	Medium polish
2012 14:29	2.47	Light grayish green; fuschite like material	Cache	Heavy polish
2012 14:29	0.09	Light to medium mottled green	Cache	Heavy polish
2012 14:29	0.10	Light to medium mottled green	Cache	Heavy polish
2012 14:29	0.05	Light to medium mottled green	Cache	Heavy polish

Table 8.7. Polished Stone Beads: Miscellaneous Fragments (continued)

Prov.	Wt	Color	Context	Comments
2012 14:29	0.25	Light green	Cache	Medium polish
2012 14:29	0.19	Light green	Cache	Medium polish
2012 14:29	0.28	Light green	Cache	Heavy polish
2012 14:30	0.32	Light green	Cache	Heavy polish
2012 14:30	0.21	Light green	Cache	Heavy polish
2012 14:30	0.06	Bright apple green	Cache	Heavy polish
2012 14:30	0.09	Bright apple green	Cache	Heavy polish
Protoclassic				
2012 12:34	0.17	Dark green; fuschite like material	Burial	Medium polish
2012 12:34	0.15	Very light green	Burial	Medium polish
2012 12:34	0.33	Light grayish green	Burial	Medium polish
2031 3:25	0.41	Light to medium mottled green	Midden	Heavy polish
2031 6:81	0.92	Light to medium mottled green	Plaster floor	Light polish
2031 5:100	0.63	Light to grayish mottled green	Midden	Light polish

In the case of the fragments from Op 2012 14:29 they may actually represent a single specimen that was fragmented, possibly during a depositional ritual. However, it is difficult to verify this postulation since no fragments could be re-fitted. Even though the re-fitting attempts were unsuccessful it is still possible that the fragments may belong to partially fragmented specimens but post depositional processes have rendered them un-reconstructable. It is also possible that not all small fragments were recovered during the excavation and screening process.

Polished Stone Celts

From Colha, one complete, and seven fragments of celts have been recovered from midden (n=4), unknown (n=3), and burial (n=1) contexts (Figure 8.2; Table 8.8; Buttles 1992a; Johnson n.d.). Only three specimens were examined for this study, data on the remaining four celts were obtained from Johnson (n.d.). Polished stone celts or adzes have a long documented history in the Mesoamerican region. This artifact form is common to the Olmec, Maya, and Aztec, among others (Adams 1991:73; Chenault 1988; Coe 1959; Delgado 1965; Drucker 1952, 1955; Drucker et al. 1959; Garber 1989; Kidder 1947; Lee 1969; Proskouriakoff 1962; Sheets 1978; Kidder 1951; Thomson 1987).

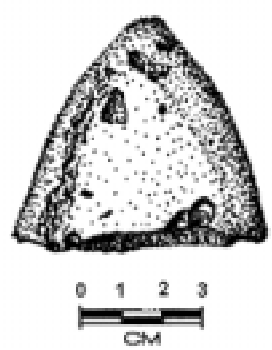


Figure 8.2. Early Postclassic Polished Greenstone Celt from Op 2010 1:7 (after Taylor 1980)

Table 8.8. Polished Stone Celts

Prov.	L	W	Th	Material/ Color	Context	Comments
early Middle Preclassic						
20313:54	4.80	1.20	1.05	Dark green serpentine	Burial	Light polish on bit end
2003 22:6	3.87	3.91	2.29	Light to dark green mottled	Unknown	Fragment; distal bit end only; edges finely ground and polished; red substance still adheres to specimen
Late Preclassic						
2002 1:5	6.10	3.10	1.20	Unknown	Lithic workshop midden	Fragment
Early Postclassic						
2010 1:7	3.90	2.70	2.10	Dark green	Midden	Fragment
Middle Postclassic						
2001 1:1	4.90	3.70	1.80	Greenstone	Lithic workshop midden	Fragment; Heavy polish confined to sides
2010 1:4	2.82	3.02	1.81	Dark green	Midden	
Postclassic						
2003 12:1	1.90	1.10	0.60	Dark green	Unknown	Very small fragment; possibly heat treated
2003 15:1	3.20	3.50	1.10	Gray slate	Unknown	Very small fragment

Celts are produced from a variety of stones including jadeite, serpentine, schist, and slate. Techniques used in production depend on the degree of hardness of the stone and are described in detail by Chenault (1988:99). Celts manufactured from hard stones such as jadeite were probably used as woodworking tools or plaster smoothers (Thomson 1987; Sheets 1992). Sheets (1992:113) reports that at the site of Ceren each household excavated had a hard greenstone celt. Celts produced from soft and hard greenstones are also known to have held ideological significance (Chenault 1988; Mora-Marín 1999).

The only complete celt recovered from Colha also happens to be the earliest known greenstone artifact associated with a burial from the site. The celt was positioned near the left arm of an extended adult male that was interred in a midden deposit at Op 2031:54 (Anthony 1987; Anthony and Black 1994; Young 1994). It has a flattened poll that led Johnson (n.d) to suggest that it was probably socketed and not hafted.

The second early Middle Preclassic specimen (2003 22:6) is produced from a light to dark green mottled material. An unidentified red substance adheres to portions of this celt. Celts and other polished greenstone artifacts from the Olmec area often display a red substance that has been identified as ground hematite.

Similar polished greenstone celts are reported from Altar de Sacrificios (Willey 1972), Cerros (Garber 1989), Chiapa de Corzo (Lee 1969), and Seibal (Willey 1978). A single celt from a Middle Preclassic burial is reported for the site of Altar de Sacrificios (Willey 1972).

Polished Stone Ear Ornaments

This category is comprised of five ear ornaments, four produced from greenstone and one from limestone (Figure 8.3; Table 8.9). The contexts from which these specimens were recovered include construction related materials (n=3), a midden (n=1), and cache (n=1).

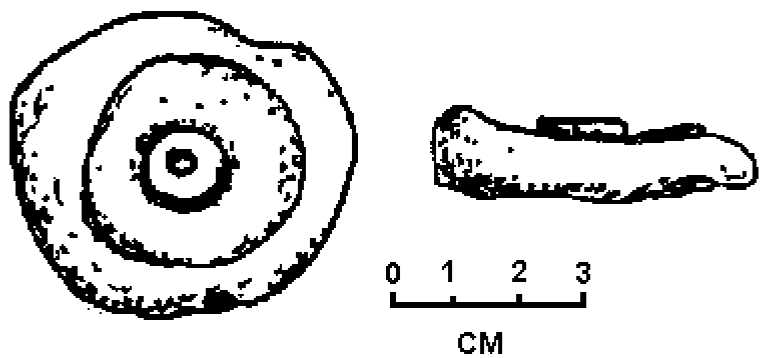


Figure 8.3. Polished Greenstone Ear Ornament

Ear ornaments are ubiquitous throughout Mesoamerican. The terms earspool, earflare, and earplugs are often used to described ear ornaments. Indeed there are a variety of forms that range from simple to elaborate in execution (Kidder 1947; Lee 1969; Sheets 1978; Kidder 1951; Thomson 1987; Willey et al. 1994). One of the distinguishing factors is the diameter of the central perforation. An example of the complex nature of ear ornaments is illustrated by Kidder (1947:42). There exists a multitude of examples of the use of ear ornaments on carved stone, ceramic vessels, and lintels (cf. Harrison 2000:132, 135, 139).

Table 8.9. Polished Stone Ear Ornaments

Prov.	D	Th	Wt	Color	Context	Comments
Late Preclassic						
2012 12:33		0.69	0.76	Light to medium green	Construction material	Heavy polish; fragment one quarter of specimen; probably associated with a burial
Protoclassic						
2012 14:45				Unknown	Cache	Curated at DOA Belize
Terminal Classic						
2012 3:3	5.01	0.96	29.06	Polished limestone	Disturbed fill above floor 1	Medium polish partially perforated; incised circle around central perforation; may be unfinished or used as building decoration
4044 7:2	3.4	1.00	12.52	Light green to bright apple green, mottled	Construction material	One side highly polished the other exhibits very little polish; one edge broken along an inclusion
Middle Postclassic						
2010 2:1	1.91	0.38	1.76	Light green to grayish green, mottled	Midden	Medium polish; back of specimen shows very little evidence of work; groove around center raised perforation

The five ear ornaments from Colha fall into the descriptive category of earflares. They are all circular disks with small central perforations. They most likely were a component of a composite ear ornament. An illustrated example of the use of ear ornaments similar to those from Colha is found in Harrison

(2000:135). Similar specimens are noted from Cerros (Garber 1989:41) and Copan (Willey et al. 1994: 302, 339).

Polished Stone Pendants

This category is comprised of all polished stone specimens, other than beads, that could have been suspended and worn (Figure 8.4). The seven specimens represented are all produced from greenstones and were recovered from cache (n=6) and burial (n=1) contexts. Although the functional term pendants is used, it is possible that some of these specimens could have been sewn onto clothing or were part of composite adornments. Four of the specimens were not available for examination as they are housed in the Department of Archaeology at Belmopan, Belize. Data on these specimens were obtained from field notes and photographs. Physical descriptions of each pendant are provided, as these details are not easily conveyed in table format.

Polished greenstone pendants are reported in many forms including anthropomorphic, zoomorphic, and geometric. Their execution also ranges from very simple to elaborate. The pendant subforms represented at Colha include rectangular, recycled bead, tear drop, tooth, and zoomorphic. At Colha, the pendant forms are in keeping with those reported from sites in Belize of similar size (Garber 1989; Hammond 1991b; Robichaux 1998).

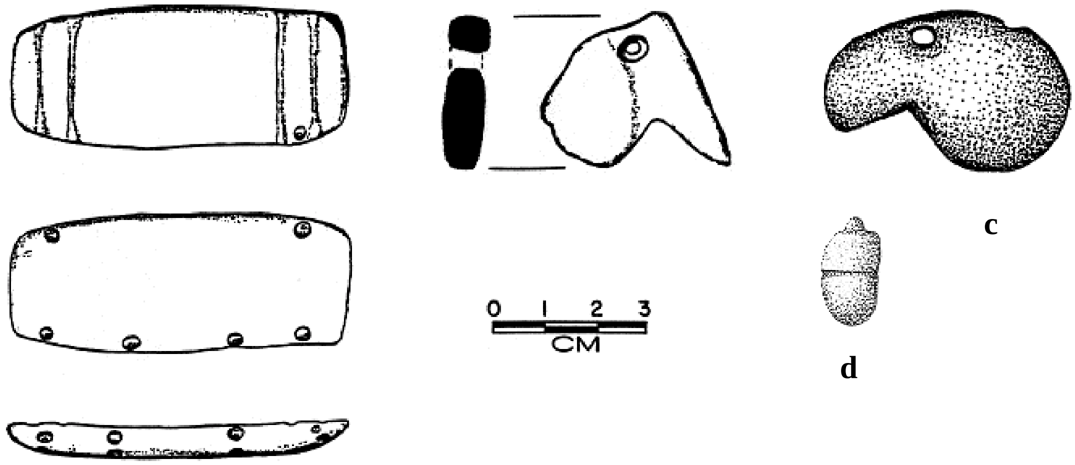


Figure 8.4. Polished Greenstone Pendants: a) early Middle Preclassic rectangular pendant (2012 5:15); b) early Middle Preclassic indeterminate form pendant 2012 5:15; c) Late Preclassic indeterminate form pendant (4001 F1); d) Late Preclassic tear drop pedant (2031 6:117)

Polished Stone Pendants: Rectangular

Two polished greenstone pendants, one reported from a cache and the other from a burial, with an overall rectangular form are known from Colha (Table 8.10). Recovered from the original ground surface, at the base of an early Middle Preclassic midden at Op 2012 were two pendants, one of rectangular form (Potter 1982:119; Figure 8.4a). This deposit has been interpreted as being a non-ceramic contained cache (Potter 1982). Both specimens reside in the Department of Archaeology in Belmopan, Belize and were not available for examination.

Table 8.10. Polished Stone Pendants: Rectangular

Prov.	L	W	Th	Wt	Color	Context	Comments
early Middle Preclassic							
2012 5:15	6.31	2.81	0.65		Blue-green	Cache in Midden	Curated in DOA Belize
Late Preclassic							
2031 14:107	1.52	1.05	.082	2.01	Light to medium green	Burial	Heavy polish

The early Middle Preclassic specimen warrants special mention, as it is among the earliest greenstone artifacts from Colha. Although its overall form is rectangular with rounded ends, it probably functioned as a bar pectoral. Incised on each end are two lines positioned along the vertical axis. A single perforation is positioned between each line at the top of the specimen. A total of six perforations are positioned on the back side, four along the bottom edge, and two corresponding to those visible on the front of the specimen. The four perforations along the bottom edge extend diagonally through the bottom. This specimen would have been suspended by the top two perforation with the bottom four used to suspend other objects. It is possible that the other pendant recovered next to this one was part of a composite piece.

Greenstone bar pendants have been reported from the Maya and Olmec areas (Andrews 1986; Drucker 1952; Gomez personal communication, 1991;

Proskouriakoff 1974). Another interesting factor is the material itself, a dark blue-green stone. Artifacts produced from similar material are ascribed as being of Olmec origin (Hammond 1991b, Hester, personal communication 1991; Gomez, personal communication 1991). Blue-green artifacts are also reported from early Middle Preclassic deposits at the nearby site of Cuello (Hammond 1991b:199). A pendant similar in form but of Classic date is reported from Copan (Willey et al. 1994:341, Figure 198).

The remaining rectangular pendant was recovered from a Late Preclassic burial at Op 2012 14:107 (Sullivan 1991a). The form is generally rectangular with a flat front and a convex back. A biconical perforation runs laterally along the top of the specimen on its short axis.

Polished Stone Pendants: Recycled Bead

A Late Preclassic lip-to-lip ceramic cache from Op 2031 7:86 contained a pendant produced from a recycled tubular greenstone bead (Sullivan 1991; Table 8.11). The bead was either intentionally split or broken lengthwise during its lifecycle. If the bead had broken, then reworking of this specimen reflects the behavior of recycling. The edges have been ground smooth and two biconical perforations are positioned along one lateral edge. The positioning of perforations would have allowed the convex side of the bead to be facing outwards when strung. Garber (1989:46) notes a recycled bead from a Late Preclassic context at Cerros.

Table 8.11. Polished Stone Pendants: Recycled Bead

Prov.	L	W	Th	Wt	Color	Context	Comments
Late Preclassic							
2031 7:86	1.21	0.87	0.35	0.8	Light to medium green	Cache	Medium polish

Polished Stone Pendants: Tear Drop

Recovered from the pubic symphysis region of a Late Preclassic burial at Op 2031 6:117 was a tear drop shaped pendant (Figure 8.4d; Table 8.12). A single biconical perforation in the bulb positioned at the top of the specimen would have enabled suspension. An encircling incision is located in the center of the specimen along its short axis. A tear drop polished greenstone pendant is also reported from Chiapa de Corzo (Lee 1969:140, Figure h).

Table 8.12. Polished Stone Pendants: Tear Drop

Prov.	L	W	Th	Wt	Color	Context	Comments
Late Preclassic							
2031 6:117	2.13	1.21	0.75	3.10	Light green with streaks of bright apple green	Cache	Medium polish

Polished Stone Pendants: Tooth

A single polished greenstone pendant in the form of a perforated tooth was recovered from a Late Preclassic lip-to-lip ceramic cache at Op 2012 14:30 (Table 8.13). This specimen resembles a perforated canine with the perforation occurring in what would have been the tooth's root. Similar greenstone tooth pendants are reported from Chalcatzingo (Thomson 1987: 298, Figure 17.4a) and Chalchuapa (Sheets 1978:45-46).

Table 8.13. Polished Stone Pendants: Tooth

Prov.	L	W	Th	Wt	Color	Context	Comments
Late Preclassic							
2012 14:30	1.72	0.91	0.44	1.10	Light to medium green	Cache	Medium polish

Polished Stone Pendants: Indeterminate

This category is comprised of two pendants derived from cache contexts. Both pendants are currently in curation at the Department of Archaeology in Belmopan Belize (Figure 8.4b and 8.4c; Table 8.14). All data was obtained from published reports, illustrations, and photographs.

The first pendant was recovered from the base of an early Middle Preclassic midden deposit at Op 2012 5:14 and is associated with the dark blue-green rectangular pendant/bar pectoral (Potter 1982:119). This deposit has been interpreted as representing a cache. It too is manufactured from a dark blue-green stone. Its form slightly resembles that of a sharks tooth with the tooth and tang (Figure 8.4b). It is possible that the point may have served as a blood letting implement. A single perforation would have enabled suspension. This pendant may have been part of a composite piece that included the bar pectoral.

The second pendant is reported from a possible cache context at a Late Preclassic lithic workshop at Op 4001 (Figure 8.4c; Shafer and Oglesby 1980:201).

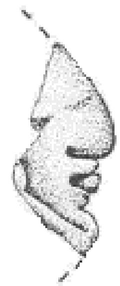
Its overall form is oval with a triangular shape extending from the body. A single perforation would have allowed suspension. Associated with this cache also were two stemmed macroblades.

Table 8.14. Polished Stone Pendants: Indeterminate

Prov.	L	W	Th	Color	Context	Comments
early Middle Preclassic						
2012 5-14	3.10	3.47	.76	Dark blue-green	Cache in Midden	Curated at DOA Belize
Late Preclassic						
4001 (F1)				Unknown	Cache	Curated at DOA Belize

Polished Stone Miscellaneous: Anthropomorphic

This form category is represented by a single subform of a fragmented anthropomorphic polished greenstone object that was recovered from a Terminal Classic deposit at Op 2012 (Figure 8.5; Potter 1982:102). This Terminal Classic deposit consisted of the pendant, hundreds of fragments of Palmar Orange polychrome plates, obsidian, and the disarticulated remains of 25 individuals (Potter 1980; Scherer n.d.). All data was obtained from photographs and illustrations as the specimen is under curation in the Department of Archaeology in Belmopan, Belize. The remaining portion of this artifact is a rendition of a human profile with something protruding from its mouth. It is possible that this piece may have been a pendant. However, additional speculations are not made because the piece has not been examined.



actual size

Figure 8.5. Polished Greenstone Miscellaneous: Anthropomorphic 2012 5:3 (after Potter 1982:102)

GROUND STONE

Included here are 12 artifacts that were manufactured from stone by processes of pecking and grinding. Although surface polish may be visible on some of the specimens, it is due to use and not an intentional step in the manufacturing process. Not considered here are manos, metates, and hammer stones. For information regarding these items the reader is referred to Buttles (1992a) and Johnson (n.d.).

Within the ground stone assemblage are found the form categories of bark beaters, disks, figurines, labret, punches, tenons, stamps, and miscellaneous. Subform categories are found within the bark beater, punch, and miscellaneous categories. Overall, the forms represented are in keeping with those reported from the Maya area.

Ground Stone Bark Beaters

This category is comprised of three bark beaters recovered from construction related (n=2) and an unknown (n=1) context (Tables 8.15, 8.16, and 8.18). Each is represented by a subform, rectangular, oval, and round. Bark beaters are thought to have been used to pound bark into thin sheets of bark paper or bark cloth (Weaver 1993:142). They occur predominantly in Late Classic context although examples are known from the Middle and Late Preclassic at Cuello (Hammond 1991a: 189), Late Preclassic at Chalchuapa (Sheets 1978:40), and Protoclassic at Barton Ramie (Willey et al.1965:469).

Ground Stone Bark Beaters: Rectangular

This single specimen that represents the rectangular subform was recovered from Late Classic construction fill context during excavations into an elite structure at Op 2025 1:2 (Eaton 1982; Table 8.15). One edge of the specimen has been fragmented; the remaining form is rectangular with rounded edges; a hafting groove encircles the complete sections. Evidence of pecking and grinding are seen along the intact edges. Each face has been incised creating striations or grooves of varying width. On face one, the striations are 0.26 cm to .22 cm in width and on face two, 0.46 cm to 0 .43 cm in width.

Rectangular shaped bark beaters are reported from Altar de Sacrificios (Willey 1972:125), Barton Ramie (Willey et al. 1965:469), Cerros (Garber 1989:34), Chiapa de Corzo (1969:127-129), Copan (Willey et al. 1994:241), Cuello

(Hammond 1991a), Kaminaljuyu (Gómez and Ericastilla 1996), and Seibal (Willey 1978:79-80). The rectangular bark beater appears to be the most commonly reported form.

Table 8.15. Ground Stone Bark Beaters: Rectangular

Prov.	L	W	Th	Wt	Context	Comments
Late Classic						
2012 1:2	4.45	7.58	4.92	244.88	Construction fill	Striations both faces

Ground Stone Bark Beaters: Oval

This fragmented oval bark beater was recovered from a Terminal Classic midden context at Op 2025 12:2 (Eaton 1982; Table 8.16). The edges have been pecked, ground, and rounded, a slight hafting groove encircles the piece, and both faces have been striated. The striations on both faces are quite irregular and are not very deep and on one face sections have broken away. The striations on one face are 0.28 cm to 0.24 cm wide and on the other 0.32 cm to 0.29 cm. This bark beater may represent an unfinished specimen.

Oval shaped bark beaters are reported from Altar de Sacrificios (Willey 1972:125), Barton Ramie (Willey et al. 1965:469), Cuello (Hammond 1991a), and Seibal (Willey 1978:79-80).

Table 8.16. Ground Stone Bark Beaters: Oval

Prov.	L	W	Th	Wt	Context	Comments
Late Classic						
2012 12:2	9.43	8.54	5.93	750.94	Construction fill	Striations both faces

Ground Stone Bark Beaters: Round

A round bark beater was recovered during excavations at Op 3060, the specific context of this specimen is unknown (Table 8.17). Its edges are slightly ground and a faint hafting groove is visible. Light striations are present only on one face and they range from 0.35 cm to 0.22 cm in width. It is highly likely that this specimen is unfinished. A fragmented bark beater whose complete form was probably round is reported from Macanché Island, El Petén (Rice 1987:227, Plate XXIV).

Table 8.17. Ground Stone Bark Beaters: Round

Prov.	D	Th	Wt	Context	Comments
Late Classic					
3060	7.47	3.12	263.03	Unknown	Striations on one face

Ground Stone Disks

Two partially burned limestone disks have been recovered from Colha (Figure 8.6; Table 8.18.). Limestone disks are reported from varying contexts throughout the Maya area (cf. Garber 1989,1995; Hammond 1991a; Lee 1969; Phillips 1976; Proskouriakoff 1962; Sheets 1978; Sidyrs and Andersen 1976; Valdez and Buttles 1995; Willey 1972, 1978; Willey et al. 1965, 1994). It is highly likely that this artifact form was multifunctional. Possible uses for the disk form include pot lids, pot rests, beehive plugs, censor supports, construction stones and warming stones (Garber 1989; Hammond 1991a; Ricketson and Ricketson 1937;

Sidrys 1976; Willey 1972). The Colha specimens are similar in form to those reported from Cerros (Garber 1989), Chan Chen (Sidyrs 1983), and Cozumel (Phillips 1979).

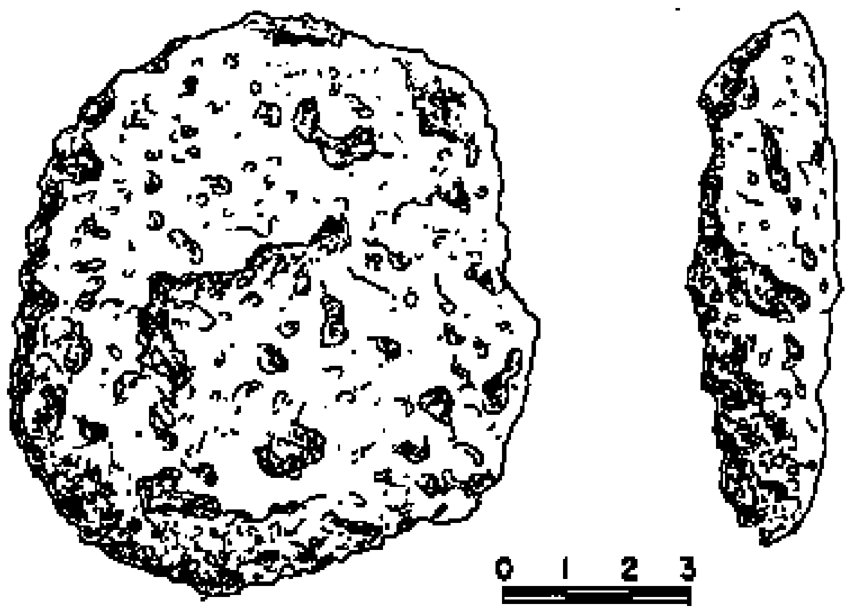


Figure 8.6. Late Preclassic Ground Stone Disk from Op 2031 5:90

Table 8.18. Ground Stone Disks

Prov.	D	Th	Wt	Context	Comments
Late Preclassic					
2031 5:90	8.7	2.41	132.22	Midden	irregular partially burned
Unknown					
2031 1:1	6.29	2.89	93.06	Plow zone; disturbed context	Fragment, one-half of specimen; edges are ground smooth; evidence of burning

At Cerros 76.2% of the 101 limestone disks show evidence of burning (Garber 1989:32). Furthermore, the majority of disks at Cerros were recovered from deposits that have been deemed as termination rituals. Associated also with these deposits were "beer" mugs with ceramic lids. Garber (1989:32) suggests that many of the Cerros limestone disks may have functioned as lids for beer mugs.

Ground Stone Figurines

This category is comprised of two specimens that fall under a single subform category of anthropomorphic limestone figurines (Table 8.19). Anthropomorphic ground stone figurines are reported from Cerros (Garber 1989:36), Chalchuapa (Sheets 1979:39), Chiapa de Corzo (Lee 1969:109), Copan (Willey et al. 1994:258), Nebaj (Kidder 1951:51), and Tonina (Becquelin and Taladoire 1990:1689). The majority of figurines recovered from the Mesoamerica area are produced from modeled and or molded clay.

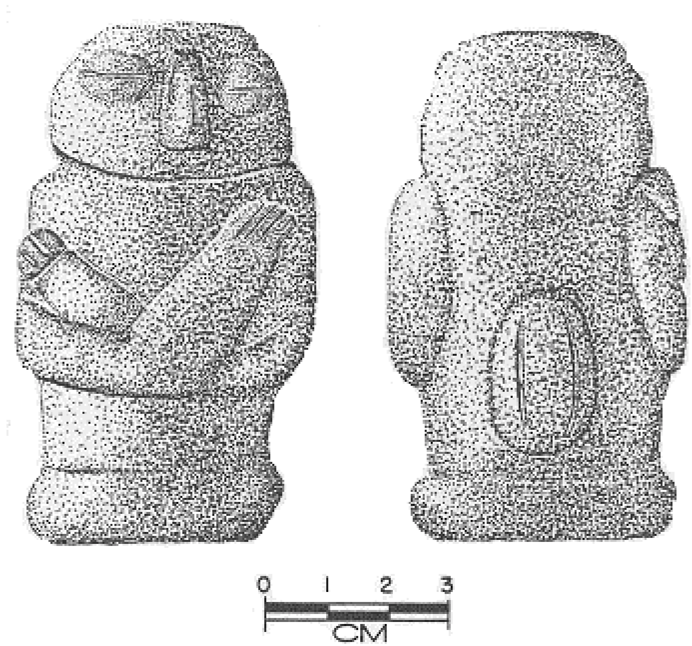


Figure 8.7. Terminal Classic Ground Stone Anthropomorphic Figurine from Op 2024 10:1 (after Eaton 1980)

Ground Stone Figurines: Anthropomorphic

Two limestone anthropomorphic figures were recovered from construction related contexts at Colha (Table 8.19). The late Middle Preclassic specimen was recovered from construction fill at Op 2012 5-9 (Potter 1980). This figurine is crudely executed and is represented by a standing figure with a head, torso, and parted legs. Facial features that have been carved include eyes and a nose. On the top of the head are four drilled holes. The meaning behind this unusual feature is unknown. One supposition is that it may represent, or have been used in, a curing ritual or just practice attempts at drilling (Buttles 1992a). Preclassic anthropomorphic limestone figures are reported from Chalchuapa (Sheets 1978:39) and Chiapa de Corzo (Lee 1969:109).

The second specimen was recovered from construction fill dating to the Terminal Classic at Op 2025 10:1 (Figure 8.7; Eaton 1980). It is represented by a standing figure with arms crossed. The face displays two eyes and a nose that are executed in raised relief. On the back of the specimen is a round object in raised relief that has been incised. Classic period ground stone figurines are reported from Cerros (Garber 1989:36), Copan (Willey et al. 1994:258), Nebaj (Kidder 1951:51), and Tonina (Becquelin and Taladoire 1990:1689).

Table 8.19. Ground Stone Figurines: Anthropomorphic

Prov.	L	W	Th	Wt	Context
late Middle Preclassic					
2012 5-14	8	4.38	2.34	79.68	Construction material
Terminal Classic					
2011 10: 1	8.64	5.03	4.08	211.32	Construction material

Ground Stone Labret

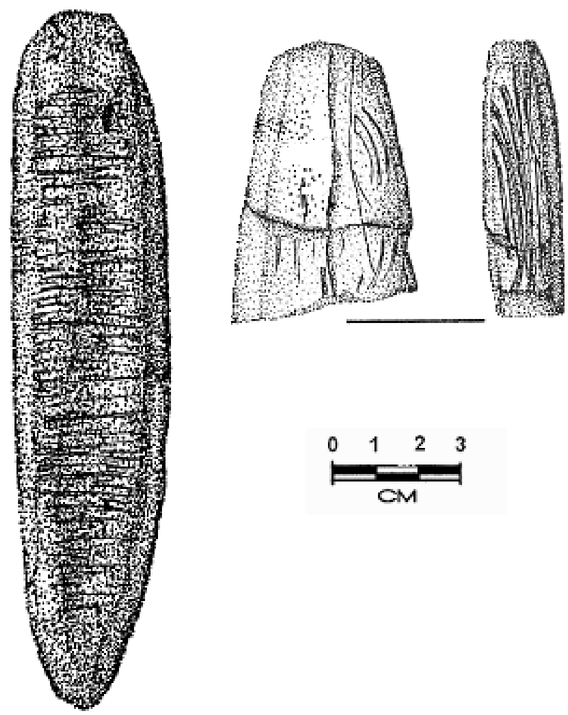
From Colha is reported a single ground stone labret recovered from an unknown context. Labrets are thought to have functioned as lip and/or ear ornaments. This is confirmed by their positioning in burial contexts where they are reported as single occurrences as well as in pairs near the cranium (Kidder 1947:64;

Hageman, personal communication 2002). Labrets are comprised of a shank and a spike. The shank runs vertical with the spike extending straight out from the top of the specimen. The spike is the decorative element. The length of the shank probably dictates where the labret was used. Those with long shanks were probably used as ear ornaments and those with short shanks for the lip. Ground stone labrets are reported from Altar de Sacrificios (Willey 1972), Cerros (Garber 1989), Tikal (Moholy-Nagy 1994), and Uaxactun (Kidder 1947).

The Colha limestone labret was recovered during off-mound excavations into Op 4048 1:1 F53 (King 2000:373). The context of this piece is problematic as King (2000:375) states that the artifacts recovered may actually represent erosion from neighboring structures. Information will not be presented in table format as it is best relayed in text format. The shank on this limestone labret has broken away so the complete length is unknown. The remaining shank measures 1.98 cm, and the spike 1.02 cm, and it weighs 3.84 g. In keeping with the shell labret from Colha, this specimen also is in the form of a mushroom or a phallis. Limestone labrets are reported from Cerros (Garber 1989) and Uaxactun (Kidder 1947).

Ground Stone Punches

This category is comprised of two ground stone punches manufactured from slate recovered from a midden and an unknown context (Figure 8.8; Table 8.20). Stone punches functioned as indirect percussion implements in the production of chert and obsidian blades (Clark 1991; Hester, personal communication 2002). Similar stone punches are used by modern day Lacandon Indians of southern Mexico in the production of chert and obsidian blades (Hester, personal communication 2002).



a

Figure 8.8. Ground Stone Punches: a) Early Postclassic 2010 1:7; b) unknown context (after Taylor 1980)

Table 8.20. Ground Stone Punches

Prov.	L	W	Th	Wt	Context	Comments
Early Postclassic						
2010 1:7	12.77	2.59	1.91	79.68	Midden	Medial and side wear in the form of striations
Unknown						
	8.27	2.20	3.45	35.26		Fragment

The first specimen was recovered from an Early Postclassic midden at Op 2010 1:7 (Taylor 1980). At its medial section along the vertical axis are found several horizontal scratches or incisions. Vertical scratches are also visible along the edges. Hester (personal communication 2002) suggests these marks resulted from platform preparation. The ends are prepared and faceted. The second specimen is of unknown provenience. It is a much shorter specimen and displays wear in the form of striations on one end only. The opposing end is fragmented.

Ground Stone Stamp

This category is comprised of a single stamp of the subform cylindrical, executed in limestone (Table 8.21). This specimen was recovered from Late Preclassic construction fill possibly associated with a cache deposit (Potter, personal communication 1991). At Colha, two modeled clay stamps one of the cylindrical form were recovered from a Postclassic midden deposit at Op 2037.

Table 8.21. Ground Stone Stamp

Prov.	L	D	Wt	Context	Comments
Late Preclassic					
2012	5.25	2.80	41.20	Construction fill	Red substance adhering to specimen

Cylindrical roller stamps are typically produced from modeled or molded clay (Coe 1959; Garber 1978; Lee 1969; Sheets 1978; Willey 1974; Willey et al. 1994). The only other reported Preclassic polished limestone cylindrical roller stamp is from Uaxactun (Juan Antonio Valdes, personal communication 1991). Hammond (1991a:191, Figure 8.52) does report a Preclassic limestone cylindrical stamp from Cuello, with a geometric design on only one end of the specimen, not on the cylinder itself.

The specimen is comprised of two panels separated by a central ridge. The panels are carved in a low relief of geometric designs. The designs on the panels are each different. The ends have been biconically drilled creating a central perforation that could have been used to hold a handle that would enable hands free pressure for imprinting the design. An unidentified red substance still adheres to this specimen.

Cylindrical stamps are thought to have been used to imprint designs on hides, fabric, clay, and flesh (Hammond 1991a; Joyce 1999). Ricketson and Ricketson (1937:34) suggest that they may have also functioned as beads. The red pigment adhering to this specimen may have been used to imprint its design in a manner described above.

Ground Stone Tenon

A single example of a fragmented ground stone tenon manufactured from limestone was recovered from a Late Classic construction fill context at 2008 13:2 (Figure 8.9; Table 8.22; Escobedo 1980a). A "tenon" is classified as such because of a projection (the tenon) that would have enabled it to be inserted or socketed into a mortise of the same dimension.

The carved section of this fragmented specimen displays in low-three-dimensional-relief a design. There is not enough of the specimen remaining to determine the actual design that was depicted on the complete form. The tenon measures 6.66 cm in length, 4.94 cm in width, and 2.92 cm in thickness. The carved element measures 6.16 cm in length, 10.36 in width, and 3.25 cm in thickness.

Table 8.22. Ground Stone Tenon

Prov.	L	Wt	Context	Comments
Late Classic				
2008 13:2	12.82	539.16	Construction fill/floor	Low-relief carving

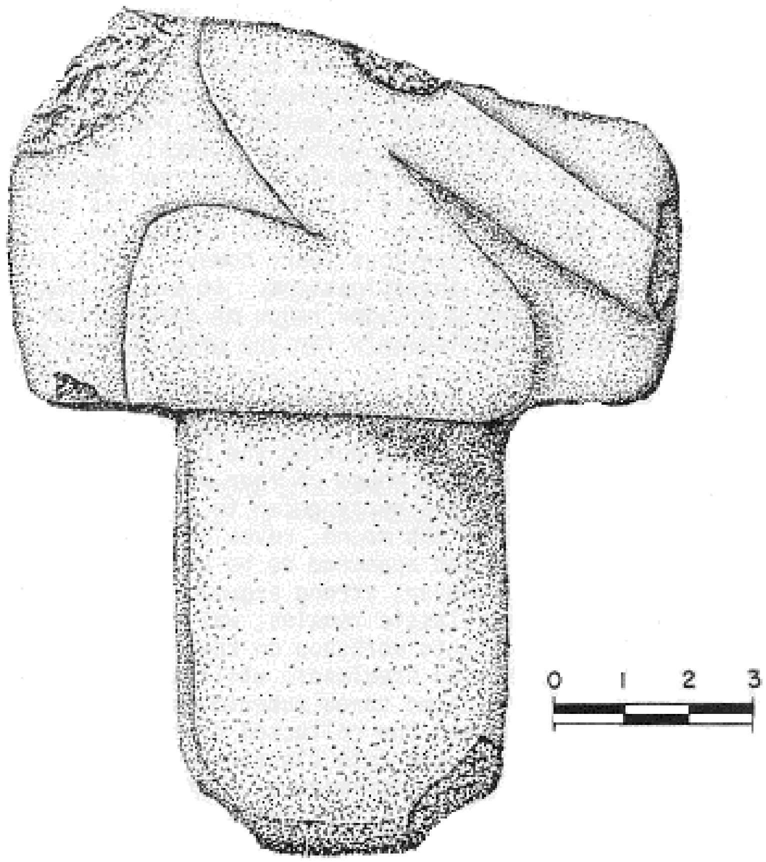


Figure 8.9. Ground Stone Tenon from Op 2008 13:2 (after Escobedo 1980)

CONTEXTUAL PATTERNS AND TRENDS

Within the Colha portable material culture are found 151 artifacts manufactured from stone. Stone artifacts have been divided into two categories based on manufacturing techniques and include polished stone and ground stone. Contextual patterns and trends are discussed for each category separately.

Polished Stone

Of the 139 polished stone artifacts, all but one is produced from greenstone. One specimen was manufactured from limestone. Polished stone artifacts are among the earliest known portable artifacts at Colha. By far, the majority (122) was derived from Preclassic deposits (Table 8.23). As illustrated in Table 8.24, distinct contextual patterns are found and are discussed below. Special attention is made to cache and burial contexts as the majority polished stone artifacts were derived from these two contexts.

As noted above, the majority (n=122 or 87.7%) of polished greenstone artifacts were recovered from Preclassic contexts. Polished greenstone artifacts first appear during the Middle Preclassic in the form of pendants and beads. It is not until the Late Preclassic that this artifact category is recovered in substantial quantities (n=60 or 43.1%). Polished greenstone continues in relatively stable quantities during the Protoclassic as well (n=51 or 35.6%). The Late Classic (n=1) and Terminal Classic (n=2) periods are highly under represented by polished stone greenstone artifacts.

Table 8.23. Temporal Distribution of Polished Stone Artifacts

Artifacts		**Temporal Data**									
Form	**Subform**	**eMPC**	**lMPC**	**LPC**	**PRC**	**LC**	**TC**	**EPC**	**MPC**	**PC**	**Unknown**
Beads											
	Subspherical			11	10				2		1
	Tubular	1		10	19			1			
	Barrel			11	3				1		
	Disk		4	8	12	1					1
	Rectangular		1								
	Triangular										1
	Fragments		1	13	6						
Celts		2		1				1	2	2	
Ear Ornaments				1	1		2		1		
Pendants											
	Rectangular	1		1							
	Recycled Bead			1							
	Tear Drop			1							
	Tooth			1							
	Indeterminate	1		1							
Miscellan-eous											
	Anthropo-morphic										1
TOTALS		**5**	**6**	**60**	**51**	**1**	**2**	**2**	**6**	**2**	**4**

As demonstrated in Table 8.25, burial and cache contexts account for the majority of polished greenstone artifacts (n=109 or 78.4%). Tables 8.26 and 8.27 serve to illustrate the temporal distribution of these two contexts. Polished stone artifacts associated with early Middle Preclassic burials are limited to a tubular bead and a celt. The majority (n=4) of late middle Preclassic polished stone artifacts are of the disk bead subform. Three of the disk beads were recovered from the skull region of interred individuals, suggesting placement in the mouth. The placement of beads in the mouth of the deceased is a long documented tradition of the Maya (Kidder 1947).

Table 8.24. Contextual Distribution of Polished Stone Artifacts

Artifacts		**Contextual Data**					
Form	**Subform**	**Burial**	**Cache**	**Midden**	**Lithic Workshop Midden**	**Construction material**	**Unknown**
Beads							
	Subspherical	1	18	2		2	1
	Tubular	20	10	1			
	Barrel	10	3	2			
	Disk	18	5			1	2
	Rectangular	1					
	Triangular						1
	Fragments	3	13	2		2	
Celts		1		2	2		3
Ear Ornaments			1	1		3	
Pendants							
	Rectangular	1	1				
	Recycled Bead		1				
	Tear Drop	1					
	Tooth		1				
	Indeterminate		2				
Miscellan-eous							
	Anthropo-morphic						1
TOTALS		**56**	**55**	**10**	**2**	**8**	**8**

By the Late Preclassic the number (19) of polished greenstone artifacts associated with burials increases. A single burial of an infant at Op 2012 produced 12 of these specimens. The trend of including polished greenstone artifacts in burial contexts continues into the Protoclassic. An elaborate burial of a female at Op 2031 accounts for 21 of the 30 Protoclassic polished greenstone beads recovered from burial contexts. Excavated burials dating to the Classic and Postclassic were void of polished greenstone artifacts.

Table 8.25. Polished Stone Artifacts from Burial Contexts

Artifacts		**Temporal Data**			
Form	**Subform**	**eMP**	**lMP**	**LPC**	**PRC**
Beads					
	Subspherical				1
	Tubular	1		3	16
	Barrel			9	1
	Disk		4	5	9
	Rectangular		1		
	Fragments				3
Celts		1			
Pendants					
	Rectangular			1	
	Tear Drop			1	
TOTALS		**2**	**5**	**19**	**30**

Cache deposits containing polished greenstone artifacts first occur during the early Middle Preclassic (Table 8.25). A single deposit produced two pendants manufactured from a dark blue-green stone. By the Late Preclassic cache deposits were comprised of lip-to-lip ceramic vessels as containment units. The majority, n=37 or 26.6%, of greenstone artifacts were recovered from Late Preclassic caches.

The tradition of lip-to-lip cached vessels containing polished greenstone artifacts continues into the Protoclassic. However, the number associated greenstone artifacts have decreased slightly (21 or 15.1%).

Table 8.26. Polished Stone Artifacts from Cache Contexts

Artifacts		**Temporal Data**			
Form	**Subform**	**eMP**	**lMP**	**LPC**	**PRC**
Beads					
	Subspherical			11	7
	Tubular			7	3
	Barrel			1	2
	Disk			2	3
	Fragments			13	
Ear Ornaments				1	
Pendants					
	Rectangular	1			
	Recycled Bead			1	
	Tear Drop				
	Tooth			1	
	Indeterminate	1		1	
TOTALS		**2**		**38**	**15**

No Classic or Postclassic caches have been recovered that contained polished greenstone artifacts. However, it is possible that their inclusion in Classic and Postclassic midden and construction fill deposits has ritual significance as suggested by Garber (1989) and Hammond (1991b). Midden and construction related deposits produced 14.3% of the complete assemblage.

The contextual distribution of the Colha polished stone artifacts is similar to that seen at the sites of Cerros (Garber 1989) and Cuello (Hammond 1991b). The forms and subforms recovered from Colha are in keeping with those from sites throughout the Maya lowlands (cf. Garber 1989; Hammond 1975, 1991a; Kidder 1947, 1951; Lee 1969; Moholy-Nagy 1994; Pendergast 1979; Willey 1972, 1978; Willey et al. 1994). However, the number of polished stone artifacts represented by the Classic (n=3) seems small considering the size of Colha during this period.

Ground Stone

The number of ground stone artifacts represented in this analysis is low (n=12) (Table 8.27). Due to the low numbers no significant contextual patterns or trends were noted (Table 8.28). Additional ground stone is represented at Colha in the form of manos and metates. For information regarding these artifact forms the reader is referred to Buttles (1992) and Johnson (n.d.). Occupational phases represented by ground stone are late Middle Preclassic, Late Preclassic, Late Classic, and Postclassic. The majority of ground stone artifacts were recovered from construction related deposits (Table 8.28).

Table 8.27. Temporal Distribution of Ground Stone Artifacts

Artifacts		Temporal Data							
Form	**Subform**	**eMPC**	**lMPC**	**LPC**	**PRC**	**LC**	**TC**	**EPC**	**Unknown**
Bark Beaters									
	Rectangular					1			
	Oval						1		
	Round								1
Disks				1					1
Figurines	*Anthropomorphic*		1				1		
Labret									1
Punches								1	1
Stamp				1					
Tenon						1			
TOTALS			**1**	**2**		**2**	**2**	**1**	**4**

Table 8.28. Contextual Distribution of Ground Stone Artifacts

Artifacts		Contextual Data					
Form	**Subform**	**Burial**	**Cache**	**Midden**	**Lithic Workshop Midden**	**Construction material**	**Unknown**
Bark Beaters							
	Rectangular			1			
	Oval					1	
	Round						1
Disks				1			1
Figurines							
	Anthropomorphic					2	
Labret							1
Punches						1	1
Stamp						1	
Tenon						1	
TOTALS				**2**		**6**	**4**

CHAPTER 9

RAW MATERIAL: ANTLER

ANTLER ARTIFACTS

Two species of deer (*Cervidae)*, the white tail (*Odocoileus virginianus*) and red brocket (*Mazama Americana*) were part of the subsistence strategy at Colha (Scott 1982; Shaw 1991a; Shaw and Mangan 1994). Males of both species have antlers. Therefore, the antlers served as a source for raw material as identified at Colha.

The antlers of the red brocket deer are short, straight, and directed backwards (Emmons 1990:161). Mature white tail deer have branched antlers that can be thick with several tines or points (Emmons 1990:162). The yearling of this species displays only spikes. The white tail deer dominates the *Cervidae* faunal assemblage at Colha (Shaw 1991a; Shaw and Mangan 1994). Furthermore, their antler is more suitable for producing the types of antler artifacts represented in the Colha antler assemblage. Therefore, it is most likely that the white tail deer provided the majority of antler utilized at Colha.

Sections of antler were removed using the groove and snap technique. Evidence of this technique still remains on several of the Colha specimens. Within the Colha antler assemblage are found 125 specimens encompassing seven artifact forms, atlatl spur, zoomorphic carved antler, perforator, punches, tines, and miscellaneous fragments (Scott 1980; Shultz n.d.; Stock 1979). The majority of antler artifacts functioned as soft hammer percussion instruments as used in the production of stone tools.

Antler Atlatl Spur

Atlatl is the Nahuatl word used to describe a dart or spear thrower (Coggins 1984: 46). At Colha a single atlatl spur was recovered from a Late Classic intrusive pit within a household structure at Op 2008 4:2 (Figure 9.1; Table 9.1; Escobedo 1980a). It is thought that this specimen was attached to the distal end of an atlatl and used to engage the spear shaft (Scott 1980: 320). The Colha antler atlatl spur is unique. A review of the archaeological literature did not reveal any antler atlatl spurs. Atlatls, tips, and finger grips produced from wood and serpentine have been recovered from the Cenote of Sacrifice at Chichén Itzá (Coggins 1984:46,103-102).

The function of the intrusive pit in which this specimen was recovered is problematic. Escobedo (1980a:116) reports seven intrusive pits associated with this structure. A few of the pits contained human remains while other only sherds and debitage. The date of this deposit as Late Classic is also problematic as atlatls are predominantly a Postclassic technology (Coggins 1984: 46).

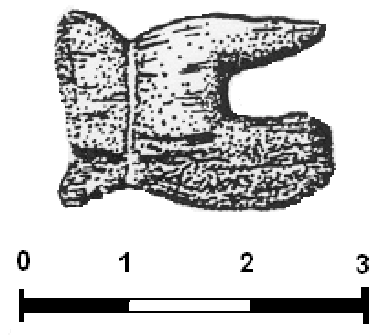


Figure 9.1 Atlatl spur from Op 2008 4:2 (after Escobedo 1980a:116)

Table 9.1. Antler Atlatl Spur

Prov.	**L**	**D**	**Context**	**Comments**
Late Classic				
2008 4:2	2.55	1.95	Intrusive pit	Context is problematic

Zoomorphic Carved Antler

A fragmented zoomorphic representation of a reptile or serpent carved from antler was recovered from a Middle Postclassic midden at Op 2010 (Figure 9.2; Table 9.2). The specimen is carved in a low three-dimensional relief. The antler has been partially hollowed and burned. This specimen was not examined for this analysis and data was obtained from photographs and published reports (Scott 1980, Shultz n.d). This specimen may have functioned as a handle or scepter (Lee 1969:162).

Table 9.2. Zoomorphic Carved Antler

Prov.	L	W	Th	Context	Comments
Middle Postclassic					
2010 4:1	5.00	2.02	1.72	Midden	Fragmented and burned

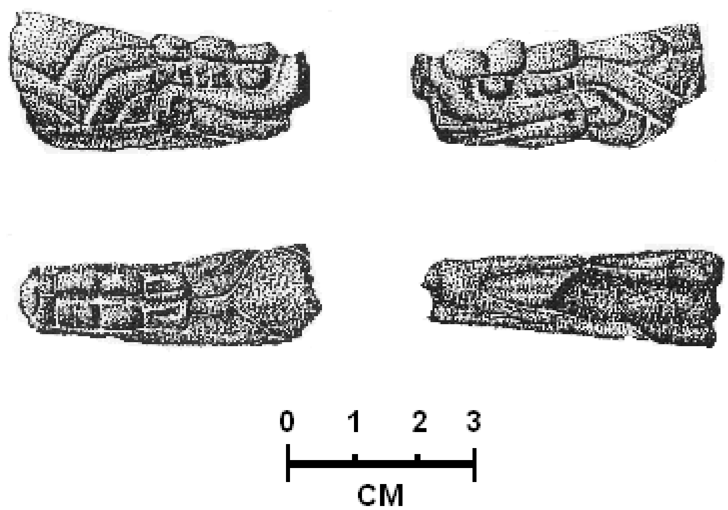


Figure 9.2. Middle Postclassic Zoomorphic Carved Antler from Op 2010 4:1 (after Scott 1980)

Antler Perforator

An antler tine that has been ground to form a sharp point was recovered from a Middle Postclassic midden at Op 2040 1:5 (Table 9.3; Michaels and Shafer 1994). It is possible that this artifact may have been used to perforate leather or perishable materials. Similar pointed antler tines are described from Altar de

Sacrificios (Willey 1972:239), Cerros (Garber 1989:57), and San Juan (Garber 1995:124).

Table 9.3. Antler Perforator

Prov.	L	W	Wt	Context	Comments
Middle Postclassic					
2040 1:5	10.36	3.34	25.14	Midden	Polish on tip

Antler Punches

The antler punch is a soft hammer indirect percussion instrument utilized in the production of stone tools (Figure 9.3; Hester and Shafer 1979, 1991a; Michaels 1994; Shafer 1979). At Colha, hard hammer percussion prevailed during the Preclassic and Late Classic eventually being replaced by soft hammer technique in the Postclassic (Hester 1982; Hester and Shafer 1991; Shafer 1979). Their use during the Postclassic at Colha is confirmed by the presence of lipped biface thinning flakes (Shafer 1979:52). Within this form category are found two subforms based predominantly on the section of antler it was produced from.

Antler Punches: Thick

The first subform is comprised of 11 short, thick sections of antler recovered from midden (n=9) construction related (n=1), and obsidian concentration (n=1) contexts (Figure 9.3a; Table 9.4). These specimens were probably manufactured from the thick branches of mature white tail often referred to as the butt end of the antler. The average length of these specimens is 7.48 cm (standard deviation 1.12 cm), average thickness 4.39 cm (standard deviation 7.30 cm), and average weight 29.48 g (standard deviation 11.97 g).

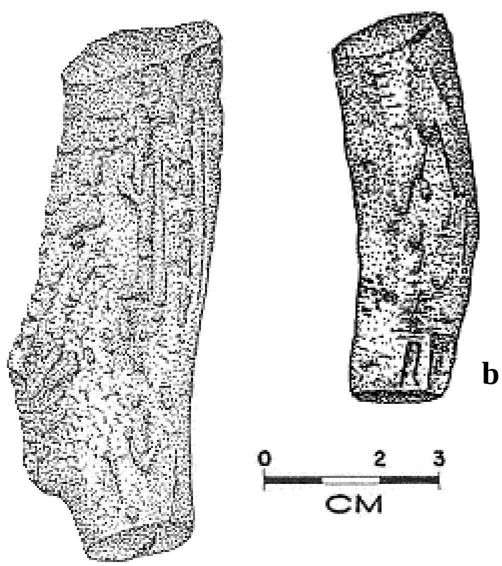


Figure 9.3. Antler Billets: a) thick punch, 2010 1:5; b) long tapering punch 2010 1:2 (after Scott 1980:319)

Table 9.4. Antler Punches: Thick

Prov.	L	W	Th	Wt	Context	Comments
Early Postclassic						
2010 1:7	9.75	2.56	2.04	43.06	Midden	Striations on one end, other end is fragmented; slightly burned; end with striations is beveled
2012 1:2	6.62	2.40	2.16	27.60	Obsidian concentration	Wear on thicker end; small vertical striations near tine end; medium polish
4044 1:3	6.31	2.82	2.41	24.52	Construction fill	Specimen not washed and is very brittle
Middle Postclassic						
2010 1:2	6.32	2.05	2.06	24.18	Midden	Medial section of antler; wear at one end; other fragmented;
2010 1:3	7.45	2.73	26.39	28.12	Midden	Fragmented on end side; both ends intact; both ends show evidence of use
2010 1:3	7.28		2.05		Midden	Fragment, only part of each end intact
2010 1:4	7.69	2.41	2.21	30.40	Midden	Ends ground
2010 1:5	7.71	2.32	2.03	25.37	Midden	Medial section; very brittle and fragmented
2010 1:5	9.21	3.32	2.73	60.94	Midden	Striations on one end; medial section; pitting/use on other end; end with striations is beveled
2037 1:3	6.65	2.19	2.00	20.48	Midden	Ends ground; groove marks visible on one tine end
2037 1:4	7.29	2.62	2.20	30.47	Midden	Ends ground; groove mark visible on one end

Antler Punches: Long Tapering

The second subform is represented by nine long tapering sections of antler recovered from midden (n=8) and unknown (n=1) contexts (Figure 9.3b; Table 9.5). These specimens were produced from tine sections that have had their points removed. The average length of these specimens is 7.85 cm (standard deviation 1.27 cm), average thickness 1.54 cm (standard deviation 0.36 cm), and average weight 24.29 g (standard deviation 15.67 g).

Table 9.5. Antler Punches: Long Tapering

Prov.	L	W	Th	Wt	Context	Comments
Early Postclassic						
2010 1:7	9.35	2.37	1.61	24.16	Midden	Tine tip removed and area ground; wear marks on tip and groove marks at base
Middle Postclassic						
2010 1:1	9.45	2.56	1.89	32.49	Midden	
2010 1:2	7.27	2.05	1.29	10.01	Midden	Lower portion of tine intact; groove marks visible on tine end
2010 1:3	7.95	1.72	1.09	14.66	Midden	Tine tip has been removed; striations occur on the remaining tip end; probably used as pressure flakers and then tine tip removed and used as punch
2010 1:5	8.73	1.76	1.49	19.37	Midden	Tine tip removed and ground, end ground as well; specimen is polished, more so on the tine end

Table 9.5. Antler Punches: Long Tapering (continued)

Prov.	L	W	Th	Wt	Context	Comments
2010 1:5	8.10	2.10	2.21	21.27	Midden	Base ground smooth were cut from antler branch; one end fragment; medium polish; wear on intact end; cut marks still visible on broken end
2010 1:5	7.17	2.05	1.73	22.09	Midden	Specimen is hollow, probably the result of deposition; specimen is brittle; evidence of slight polish
2010 1:6	7.19	1.72	1.30	14.11	Midden	Ends ground
Postclassic						
2003 18:F	5.40	1.51	1.22	62.25	Unknown	Tine tip has been removed and ground smooth; specimen is brittle; slight polish on tine end

Antler Tines

This category is comprised of 39 complete antler tines recovered from midden (n=36) and unknown (n=3) contexts (Table 9.6). Antler tines probably functioned as pressure flakers and in some cases, punches. It is also possible that some of the specimens represent waste from the production of punches. Visible use wear is indicated in the comments column.

Table 9.6 Antler Tines

Prov.	L	W	Th	Wt	Context	Comments
Early Postclassic						
2010 1:7	6.46	2.41	1.20	13.38	Midden	Tip exhibits evidence of use; entire specimen is evenly but slightly burned
2010 1:7	6.53	1.37	1.46	8.35	Midden	Rounded tip; use-wear at tip; base of tine shows evidence of cut marks for removal
2010 1:7	7.74	1.84	1.49	10.42	Midden	Tip rounded; evidence of use at tip
2040 1:6	5.07	1.60		7.51	Midden	Tip rounded base
Middle Postclassic						
2010 1:1	2.90	1.20	1.05	2.09	Midden	Burned; undetermined wear; highly eroded
2010 1:1	7.03	1.48	1.15	8.28	Midden	Use wear at tip; cut marks indicate removal
2010 1:1	8.46	1.91	1.41	12.00	Midden	Tip is partially fragmented; remaining tip area is slightly polished (light)
2010 1:2	4.68	1.30	1.32	5.01	Midden	Tine portion only; evidence of cut marks at base
2010 1:2	4.22	1.15	0.88	2.63	Midden	Tine portion only evidence of cut marks at base
2010 1:2	10.51	2.04	1.17	17.24	Midden	Evidence of use at tip
2010 1:2	8.92	1.91	1.47	12.06	Midden	Evidence of use at tip; tip rounded
2010 1:2	6.02	1.80	1.51	9.42	Midden	Evidence of use at tip; tip rounded
2010 1:2	7.68	1.69	1.18	10.35	Midden	Tip area is highly polished; slightly burned which may account for some of the overall polish; no use-wear on tip
2010 1:2	5.88	3.54	0.97	8.04	Midden	Only one tine branch remains, the other is highly fragmented
2010 1:2	9.88	2.91	1.81	21.78	Midden	Double tine; the main tine exhibits use-wear, the other tine is only 2.76 in length and shows no signs of use; base exhibits cut marks;

Table 9.6 Antler Tines (continued)

Prov.	L	W	Th	Wt	Context	Comments
2010 1:2	5.92	1.49	1.27	5.91	Midden	Tine tip rounded; slight use-wear on tip; cut marks at indicate tip area was removed
2010 1:2	8.06	2.21	1.45	16.14	Midden	Tip rounded; evidence of use at tip
2010 1:3	12.68	2.25		29.09	Midden	Data from Shultz n.d
2010 1:3	7.85	1.65	1.40		Midden	Wear on tip; possible used for pressure flaking
2010 1:3					Midden	Not available
2010 1:4	8.44	2.37	1.14	13.63	Midden	No evidence of use at tip; other tine is just .72cm in length and shows no evidence of use; cut marks at base indicate removal
2010 1:4	6.73	2.28	0.93	8.59	Midden	Heavy cut/chop marks at base indicate removal; no evidence of use
2010 1:4	6.59	1.59	1.25	9.72	Midden	Evidence of use at tip; cut marks at base indicate removal
2010 1:5					Midden	Data from Shultz n.d: evidence of wear on tip, possible from scraping
2010 1:6	8.41	2.62	1.31	25.39	Midden	Evidence of use at the tip;
2010 1:6	7.37	1.37	1.25	9.23	Midden	Tip end has broken away; cut/chop marks at the base of tip illustrate where they attempted to removed tip probably to create a punch
2010 1:6	8.72	1.06	1.09	9.01	Midden	Tip has been fractured; area around tip highly polished; base of specimen fragmented
2010 1:6	8.27	1.84	1.53	11.33	Midden	Use-wear at tip; cut/chop marks at base where removed from antler branch
2010 1:6	6.63	1.82	1.59	12.06	Midden	Rounded tip; evidence of use at tip; cut/chop marks at base
2010 1:6	5.77	1.65	1.47	8.62	Midden	Tip rounded; evidence of use at tip

Table 9.6 Antler Tines (continued)

Prov.	L	W	Th	Wt	Context	Comments
2010 1:6	4.65	1.23	0.90	3.56	Midden	Tip has been ground to a slight point; cut/chop marks at base
2010 1:6	7.41	1.97	1.38	12.32	Midden	Area around tip is highly pitted and fragile therefore not able to determine any use
2010 1:6	4.38	1.39	1.05	4.83	Midden	Tine tip rounded and slightly beveled; cut/chop marks present at base
2010 1:6	4.61	1.45	0.94	3.55	Midden	Evidence of use at tip; tip is slightly polished; cut/chop marks at base
2041 1:3	6.75	1.73		11.18	Midden	
78A	4.30	1.24	1.09	3.22	Midden	
Postclassic						
2003 14:1	1.90	1.05	0.75		Unknown	
2003 14:1	2.60	1.15	0.95		Unknown	Highly polished; groove marks visible
2003 14:1					Unknown	Missing

Miscellaneous Antler Fragments

Included in this form category are all fragments of antler. Three fragment subforms are recognized, tine tips, medial sections, and proximal sections. It is highly probable that many of these fragments when complete may have functioned as indirect precursors or pressure flakers. The fragments may also represent manufacturing debris. However, being incomplete precludes assigning them to any form category.

Miscellaneous Antler Fragments: Tine Tips

This category is comprised of 22 tine tips recovered from midden (n=20) and unknown (n=2) contexts (Table 9.7). The tips may have been used as pressure flakers (possibly hafted) or represent waste from the production of punches. The comments column is utilized to relay any visible evidence of use.

Table 9.7. Miscellaneous Antler Fragments: Tine Tips

Prov.	**L**	**W**	**Th**	**Wt**	**Context**	**Comments**
Middle Postclassic						
2001 5:1	3.04	7.82	0.69	1.12	Lithic Workshop Midden	
2001 5:1	3.12	1.31	0.80		Lithic Workshop Midden	Tip rounded
2001 5:1	2.70	0.69	0.62	0.69	Lithic Workshop Midden	Tip rounded
2001 5:1	1.71	0.76	0.45	0.45	Lithic Workshop Midden	Tip rounded
2001 5:2	3.34	1.06	0.67	1.81	Lithic Workshop Midden	
2001 5:2	4.40	1.03	0.48	1.53	Lithic Workshop Midden	
2001 5:2	2.45	1.11	0.64	1.34	Lithic Workshop Midden	
2001 11:2	4.33	1.81	1.53	6.84	Midden	
2010 1:1	2.92	1.35	0.96	2.09	Midden	Highly eroded
2010 1:1	3.48	1.76	1.29	3.64	Midden	Tip rounded; material highly eroded
2010 1:1	3.79	2.16	1.08	5.00	Midden	Cut marks at tip indicating an attempt to remove tip
2010 1:2	3.68	9.40	0.90	2.35	Midden	Evidence of use at tip; cut marks at base indicate removal; specimen is highly polished
2010 1:2	3.00	0.93	0.75	1.12	Midden	
2010 1:2	2.98	0.87	0.73	1.49	Midden	
2010 1:3	3.83	1.80	1.16	4.60	Midden	Tip rounded

Table 9.7. Miscellaneous Antler Fragments: Tine Tips (continued)

Prov.	L	W	Th	Wt	Context	Comments
2010 1:4	2.23	1.02	0.77	1.37	Midden	Evidence of use-wear at tip; recent fracture; heavy polish and slight burning
2010 1:5	3.72	1.42	1.33	4.05	Midden	Tip rounded
2010 1:5	2.70	1.10	0.98	2.17	Midden	Tip rounded; specimen is slightly polished
2010 1:6	2.30	1.12	0.81	1.55	Midden	Wear on tip and cut marks on base
2010 1:6	3.70	1.08	0.91	2.32	Midden	Tip rounded; slight evidence of use at tip
Postclassic						
2003 14:1	2.56	1.27	0.90	2.34	Unknown	Four cut marks present near tip
2003 14:1	2.75	0.76	0.73	1.04	Unknown	Tip rounded

Miscellaneous Antler Fragments: Medial Sections

This category is comprised of 29 medical sections of tine recovered from midden (n=28) and unknown (n=1) contexts (Table 9.8). These sections may have been part of punches or tines. Some specimens may also represent production waste. No visible evidence of use was found on these specimens.

Table 9.8. Miscellaneous Antler Fragments: Medial Sections

Prov.	L	W	Th	Wt	Context
Middle Postclassic					
2001 5:1	3.69	0.99	0.54	1.15	Midden
2001 5:1	4.54	2.13	1.03	6.08	Midden
2001 5:1	2.91	1.22	0.89	1.99	Midden
2001 5:1	5.05	2.06	1.00	7.08	Midden
2001 5:1	3.17	1.48	0.60	1.96	Midden
2001 5:1	2.97	1.44	0.66	1.86	Midden
2001 5:1	2.33	1.58	0.96	0.90	Midden

Table 9.8. Miscellaneous Antler Fragments: Medial Sections (continued)

Prov.	L	W	Th	Wt	Context
2001 5:2	3.10	0.98	0.78	1.01	Midden
2001 5:2	3.46	1.32	0.77	1.71	Midden
2001 5:2	5.88	1.43	0.55	3.90	Midden
2001 5:2	3.99	1.35	0.83	2.85	Midden
2001 5:3	3.67	0.92	0.86	1.89	Midden
2001 5:3	3.79	1.04	0.85	1.99	Midden
2001 5:3	2.49	1.03	0.57	1.07	Midden
2001 5:3	3.90	1.67	0.68	3.25	Midden
2001 5:3	3.84	1.58	0.90	4.42	Midden
2001 5:3	3.80	1.77	0.82	4.00	Midden
2001 5:3	3.56	1.71	0.88	4.58	Midden
2001 5:3	4.08	1.64	0.75	3.91	Midden
2001 5:3	3.10	1.52	0.71	2.42	Midden
2001 11:1	4.32	0.85	0.70	1.79	Midden
2001 11:1	4.14	1.90	1.05	5.28	Midden
2010 1:1	4.72	1.75	1.20	4.17	Midden
2010 1:1	2.86	2.81	0.99	1.99	Midden
2010 1:1	3.70	1.49	1.20	4.34	Midden
2010 1:1	4.81	1.39	0.78	3.04	Midden
2010 1:2	3.66	1.79	1.38	6.31	Midden
2010 1:2				5.86	Midden
Unknown					
2002 1:2	5.15	1.83	1.42	7.19	Disturbed Surface

Miscellaneous Antler Fragments: Proximal Sections

This category is comprised of 12 proximal sections of antler tines and branches all reported from midden contexts (Table 9.9). These sections may have been part of punches or tines. Some specimens may also represent production waste. The comments column is utilized to relay any evidence of use.

Table 9.9. Miscellaneous Antler Fragments: Proximal Sections

Prov.	L	W	Th	Wt	Context	Comments
Middle Postclassic						
2001 5:2	5.49	1.61	0.83	4.65	Midden	
2001 5:2	3.44	2.15	1.13	4.79	Midden	
2001 5:2	2.75	1.57	0.90	2.16	Midden	
2001 11:1	0.34	1.13	1.59	6.22	Midden	
2001 11:1	3.34	1.55	0.78	2.69	Midden	
2001 11:1	4.23	1.66	0.84	3.75	Midden	
2001 11:1	3.94	2.05	0.66	4.40	Midden	
2001 11:2	3.92	1.46	0.60	2.03	Midden	
2001 11:2	3.77	1.34	0.57	2.00	Midden	
2010 1:1	5.16	1.54	1.57	8.67	Midden	Base ground
2010 1:2	3.01	2.67	1.79	9.09	Midden	Base ground
2010 1:3	6.30	3.29	1.59	24.48	Midden	One end intact; recent fracture; horizontal striations near intact end

CONTEXTUAL PATTERNS AND TRENDS

The majority (n=109 or 87.2%) of antler artifacts at Colha were derived from deposits dating to the Middle Postclassic (Table 9.10). The greatest percentages, 90.4%, are reported from midden contexts (Table 9.11). Of the 125 antler artifacts, n=122 or 97.6%, were most likely used in the production of stone tools during the Early Postclassic and Middle Postclassic.

Table 9.10. Temporal Distribution of Antler Artifacts

Artifact Form	Subform	eMP	LMP	LPC	PRC	LC	TC	EPC	MPC	PC	Unknown
Atlatl Spur						1					
Carved Antler									1		
Perforator									1		
Punch											
	Thick							3	8		
	Long Tapered							1	7	1	
Tines								4	32	3	
Miscellaneous Antler Fragments											
	Tine Tips								20	2	
	Medial Sections								28		1
	Proximal Sections								12		
TOTALS						**1**		**8**	**109**	**6**	**1**

The use of antler as soft hammer percussion instruments at Colha during the Postclassic has been extensively documented (Hester and Shafer 1979, 1991; Michaels 1994; Shafer 1979). Evidence for the use of soft hammer is provided by the large number of lipped biface thinning flakes recovered from Postclassic workshop deposits (Shafer 1979:52). According to Michaels (1994:132) "the Postclassic reduction sequence was a very straightforward soft-hammer thinning industry." Faunal data indicate that the Postclassic inhabitants had a strong reliance on white tail deer (Shaw and Mangan 1994). Therefore, this animal served not only as a source of food, but also as a source for antler.

Table 9.11 Contextual Distribution of Antler Artifacts

Form	Subform	Midden	Construction Fill	Obsidian Concentration	Problematic	Unknown
Atlatl Spur					1	
Carved Antler			1			
Perforator			1			
Punch						
	Thick	9	1	1		
	Long Tapered	8				1
Tines		36				3
Miscellaneous Antler Fragments						
	Tine Tips	20				2
	Medial Sections	28				1
	Proximal Sections	12				
TOTALS		**113**	**3**	**1**	**1**	**7**

It is interesting to note that both the white tail and brocket deer were consumed during the Preclassic and Classic periods at Colha. Additionally, artifacts produced from deer bone are also reported for these periods. Only one antler specimen of possible Late Classic origin is reported from Colha. Preclassic and Classic antler artifacts, although small in numbers, are known from Altar de Sacrificios (Willey 1972), Barton Ramie (Willey et al. 1965), Cerros (Garber 1989), Chalchuapa (Sheets 1978), Chiapa de Corzo (Lee 1969).

CHAPTER 10

RAW MATERIAL: CORAL, SPECULAR HEMATITE, METAL, AND SPELEOTHEM

This chapter presents the analysis of artifacts produced from raw materials that are highly under represented at Colha. Their small number precludes them from being treated under individual chapters. Included here are artifacts produced from coral, specular hematite, metal, and a speleothem. Due to their small quantity, no contextual patterns or trends were noted.

Coral

Recovered from midden (n=1), constructed related (n=1), and unknown (n=2) contexts at Colha were four pieces of unmodified corral (Table 10.1). Coral occurs along the coral reef of Belize and could have easily been harvested and transported inland. Coral in its raw harvested form and artifacts produced from it are found at Cerros (Garber 1989:64), Chac Balam (Garber 1995: 113), Copan (Willey et al. 1994:296), and San Juan (Garber 1995:113).

Table 10.1. Coral

Prov.	Wt	Corral Type or Form	Context
Late Classic			
2008 2:1	128.41	Brainy Coral	Construction fill
Early Postclassic			
2012 12:12		Tubular Coral	Sherd deposit
Unknown			
2036 1:1	14.83	Brainy Coral	Disturbed plow zone
?	30.3	Tubular Coral	Unknown

Metal

A metal bell was recovered from an unknown context at Op 2039 1:4. Its original form is unknown as post depositional processes have compacted the specimen. It is most likely that the bell is manufactured from copper.

Metal artifacts first appear in the Maya area during the Late Classic however, a few examples have been attributed to the Early Classic (Bray 1977; Pendergast 1962). The number reported increases by the Terminal Classic and into the Early Postclassic. Metal and metal artifacts were probably imported into the Maya area via Costa Rica, Panama, Honduras, and Mexico (Bray 1977). Cast metal artifacts were produced from the lost wax or cire perdue method (see Hodges 1989:66). Metal artifacts were also manufactured from sheet metal that was produced through cold hammering. Archaeological evidence suggests the Maya did practice metallurgy (Bray 1977).

Metal artifacts occur in a variety of forms with the most common being bells (Bray 1977; Coggins 1984; Garber 1989; Lee 1969; Pendergast 1962; Sheets 1978). Other forms represented include disks, axes, fishhooks, depilatory tweezers, and foil. They are reported throughout the Mesoamerican area and are predominantly associated with the Postclassic.

Specular Hematite

Two specular hematite artifacts were recovered from cache (n=1) and midden (n=1) contexts at Colha. Specular hematite was prized by the Maya for its reflective quality, at times utilized for mirror mosaics. When ground and mixed with water it produces a purple-red pigment that is sometimes used on ceramic vessels (Garber 1989: 92). Dunham (1996:329) notes that hematite has been recovered from the Maya mountains. Currently no other sources for this material have been recorded. According to Garber (1989:92) specular hematite occurs only in burials, caches, and termination rituals. The Colha specimens conform to this pattern.

Recovered from Op 2012 14:55 was a specular hematite flake that was contained within the Protoclassic blood letting cache (Potter 1994). The flake is 0.12 cm in length and 0.5 cm in width. Several of the artifacts from this cache displayed a red substance on them. It is possible that specular hematite was included in ground form.

Recovered from a Late Classic burial at Op 2012 12:19 was a circular disk with a central perforation manufactured from specular hematite. Its position within the burial is currently unknown. The specimen is fragmented and was recovered in three pieces. A small section is missing. The estimated diameter of the complete specimen is 2.93 cm and it is .23 cm thick. It is possible that it may have functioned as a bead or a composite mirror.

Table 10.2. Specular Hematite

Prov.	L	D	Th	Contexts	Comments
Protoclassic					
2012 14:55	0.12		0.05	Cache	Flake
Late Classic					
2012 12:19		2.93	0.23	Burial	Estimated diameter

Speleothem

Included here is an artifact produced from a speleothem that has been ground to resemble the distal fragment of a celt. Speleothem is the collective term given to stalactites, stalagmites, and flow-stone formations (Brady 1997:360). Speleothems are found in a variety of archaeological contexts (see Brady et al 1997).

The Colha specimen was recovered from an early Middle Preclassic midden containing burials at Op 2031 3:38A (Anthony 1987; Anthony and Black 1994). It is possible that it may have been associated with one of the burials. The edges have been ground smooth and vertical striations are visible in the central portion of the specimen. Determining the function of this item is problematic. Shafer (personal communication 1992) suggests that it was not a utilitarian implement.

Brady (1997:360) states that speleothems are frequently used as idols and are most commonly recovered in cache and burial deposits. He further suggests that speleothems have religious significance and can be viewed as an extension or embodiment of the power of a cave.

Table 10.3. Speleothem

Prov.	**L**	**Max W**	**Min W**	**Contexts**
early Middle Preclassic				
2031 3:38A	15.72	4.40	2.61	Midden containing burials

CHAPTER 11

SUMMARY AND CONCLUSIONS

This study has analyzed 2,264 portable artifacts produced from a variety of raw materials using a multitude of manufacturing techniques. The analysis has incorporated contextual data as part of the research and interpretations. The first section of this chapter begins by reviewing the depositional patterns that were revealed in the analysis. A summary of the contextual distributions, patterns, and depositional behaviors of the analyzed assemblage according to phases of occupation at Colha is also presented. The second part of this chapter attempts to link these patterns to the culture history of Colha. Suppositions regarding the social and cultural significance of the assemblage and contexts are also discussed.

At this time, it is to the benefit of the reader to reinforce the significance of the absence of perishable materials. According to Drooker (2001:4), 90-95% of prehistoric material culture was produced of perishable materials. Because of the absence of perishable materials, the cultural, social, and economic implications as revealed through contextual patterning may not reflect the true significance of any artifact or artifact class. It is highly probable that many artifacts found in archaeological contexts had counterparts produced from perishable materials such as wood. The absence of perishable materials may also affect the social implications of burials and the interpretations of caches.

CONTEXTUAL DISTRIBUTIONS BY OCCUPATIONAL PHASE

This section presents, according to the recognized phases of occupation at Colha, a summary of the contextual distributions and depositional behaviors of the analyzed assemblage (Table 11.1; Figure 11.1). Contextual patterns and/or trends revealed in the analysis are posited.

Table 11.1. Temporal Distribution of the Portable Material Culture of Colha

Raw Material	**Temporal Data**									
	eMP	**lMP**	**LPC**	**PRC**	**LC**	**TC**	**EPC**	**MPC**	**PC**	**Unknown**
Modeled Clay	1			1	1		6	21	25	
Reworked Ceramic Sherds	13	8	35	20	6	1	17	112	19	11
Extensively Modified Shell	440	726	127	30	3	8	2	2	1	3
Whole Modified Shell	7		3	135	6	1		16	7	2
Bone	14	42	57	12	13	3	5	17		2
Polished Stone	5	6	60	51	1	2	2	6	2	4
Ground Stone		1	2		2	2	1			4
Antler					1		8	109	6	1
Coral					1		1			1
Metal										1
Specular Hematite				1	1					
Speleothem	1									
TOTALS	**481**	**783**	**284**	**250**	**35**	**17**	**42**	**283**	**60**	**29**

Considered also for each occupational phase are the technological strategies of practical and prestige as described by Hayden (1988:11). In review, practical technologies are the solutions to practical problems of survival and comfort. The purpose of prestige technologies is "to solve a social problem or accomplish a social task such as attracting productive mates and allies or bonding members of social groups together via displays of success" (Hayden 1988:11), a key factor in prestige technologies is the availability of surplus labor.

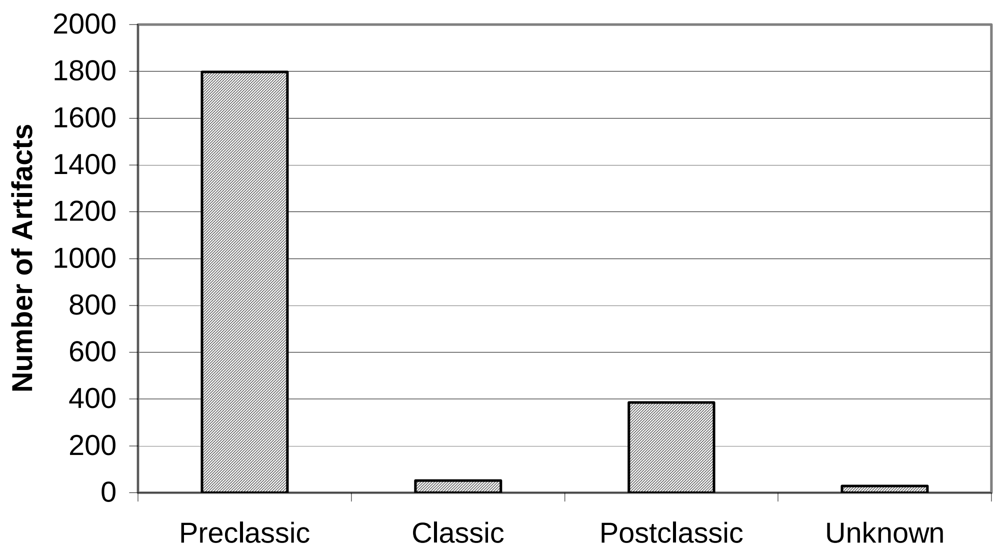


Figure 11.1. Temporal Distribution of the Portable Material Culture of Colha

As is illustrated, the majority of artifacts examined were derived from the depositional behaviors of burial, caching, and discard. Temporal patterns have been noted for these three depositional behaviors at Colha (Table 11.2; Figure 11.2). Midden deposits best exemplify the behavior of discard. However, it is important to note that the behavior of discard may also be represented in construction related contexts.

Architectural expansions often cover primary midden deposits that were associated with earlier structures. An example from Colha is found at Op 2031, where an architectural addition sealed a primary midden deposit (Anthony 1987; Anthony and Black 1994). However, it is also possible that the sealed midden deposits are not as easily identified, as was the case at Op 2031, and are thus labeled as construction fill. It is also known that midden materials were used as filler during construction at Colha (Anthony 1987; Sullivan 1991a). Thus, while not in primary context, the materials used as fill were derived from the behavior of discard.

As illustrated in Figure 11.1 and Table 11.2, the behaviors of burial and caching dominate the Preclassic assemblage. The much reduced Classic assemblage does not allow for the formation of patterns regarding depositional behaviors. During the Postclassic, the predominant depositional behavior is discard and is represented by several midden deposits.

Table 11.2. Temporal Distribution of Depositional Behaviors

Temporal Data	Burial	Cache	Midden	Construction related
Early Middle Preclassic	306	106	30	6
Late Middle Preclassic	738	24	7	13
Late Preclassic	188	40	25	13
Protoclassic	183	40	8	14
Late Classic	1		5	18
Terminal Classic	9		2	4
Early Postclassic			38	
Middle Postclassic			271	8
Postclassic			30	17
TOTALS	**1425**	**210**	**416**	**93**

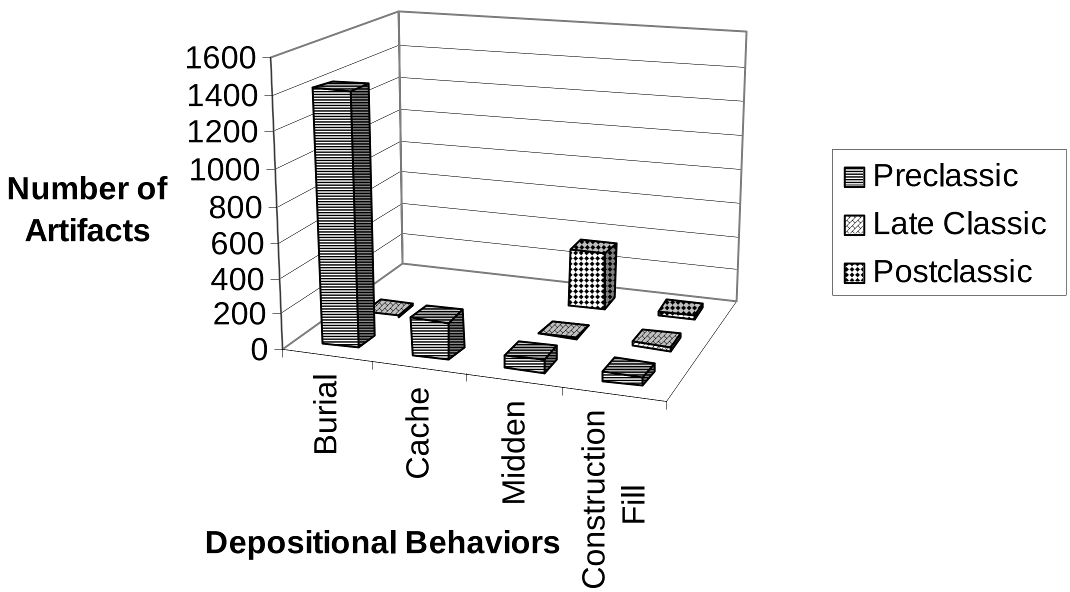


Figure 11.2. Graph illustrating the distribution of the depositional behaviors of burial, caching, and discard

Special attention is made to these three depositional behaviors during the discussions below. However, a note of caution is warranted as this discussion does not include all burials and caches, and their associated artifacts excavated at Colha. Several burials containing no associated artifacts, or only ceramic vessels and/or lithics are reported. Cache deposits comprised of only lithic material are also known from Colha (Anthony 1987; Eaton et al. 1994; Meadows 2001; Sullivan 1991a, 1991b).

Preclassic (900 B.C. – A.D. 250)

Preclassic contexts produced 1,798 artifacts and accounts for 79.4% of the total assemblage examined. In review, the Preclassic at Colha is represented by three phases, Middle Preclassic, 900 – 400 B.C., Late Preclassic, 400 B.C. – A.D. 100, and Protoclassic, AD 100 – 250. Contextual patterns and trends revealed in the analysis are posited for each of these phases.

Middle Preclassic (900 – 400 B.C.)

At Colha, the Middle Preclassic is comprised of early and late ceramic complexes, Bolay and Chiwa respectively (Valdez 1987). Data regarding contextual distributions of the Middle Preclassic assemblage are presented according to these two ceramic complexes (Tables 11.2 and 11.3). Discussion will begin by reviewing general Middle Preclassic patterns and conclude with specific details for the two ceramic complexes.

Table 11.2. early Middle Preclassic Contextual Data

Raw Material	Contextual Data						
	Burial	**Cache**	**Construction Material**	**Midden**	**Possible Post Mold**	**Ceramic lined fire pit**	**Unknown**
Modeled Clay		1					
Reworked Ceramic Sherds			5	7	1		
Extensively Modified Shell	303	98		18	12	4	5
Whole Modified Shell		6				1	
Bone			1	5			8
Polished Stone	2	2					1
Ground Stone							
Antler							
Coral							
Metal							
Specular Hematite							
Speleothem	1						
TOTALS	**306**	**107**	**6**	**30**	**13**	**5**	**14**

The Middle Preclassic assemblage is comprised of 1,264 artifacts and represents 55.8% of the total assemblage (Table 11.2 and 11.3). The majority, n=1,166 or 92.2%, of the Middle Preclassic assemblage is represented by artifacts produced from shell. Of the 1,166 shell artifacts, 1,163 are of the disk shell bead subform. Additional raw materials represented include modeled clay (n=1), reworked sherds (n=21), bone (n=56), polished stone (n=11), and ground stone (n=1).

Table 11.3. late Middle Preclassic Contextual Data

Raw Material	Contextual Data			
	Burial	Cache	Construction Material	Midden
Modeled Clay				
Reworked Ceramic Sherds			3	5
Extensively Modified Shell	698	24	1	3
Whole Modified Shell				
Bone	35		7	
Polished Stone	5		1	
Ground Stone			1	
Antler				
Coral				
Metal				
Specular Hematite				
Speleothem				
TOTALS	**738**	**24**	**13**	**8**

Burials

The majority, n=1,043 or 82.5%, of the Middle Preclassic assemblage were recovered from burial contexts. Of these, n=1,026 or 88.3%, were associated with the burials of extended supine, semi-flexed, and tightly flexed individuals (Anthony 1987; Anthony and Black 1994; Potter 1982; Sullivan 1991a). Middle Preclassic burials also contained polished greenstone beads (n=7), a polished greenstone celt, possibly a speleothem artifact, ceramic effigy vessels, spouted vessels, and ceramic bowls that were frequently placed over the face.

Three early Middle Preclassic burials associated with a residential structure at Op 2031 produced 330 disk shell beads (Anthony 1987). The burials have been identified as belonging to two adult males and one adult female (Young 1994). Early Middle Preclassic burial furniture at Colha appear to be standardized and are comprised of disk shell beads and ceramic vessels. The exception is found with the inclusion of two polished greenstone artifacts (a bead and a celt) in burial contexts (Anthony and Black 1994; Buttles 1992a).

Six burials associated with a late Middle Preclassic burial platform at Op 2012 produced 698 disk shell beads. The burials have been identified as belonging to two adult males, one adult female with fetus, one young adult (sex unknown), and two adults sex unknown (Wright n.d.b). Introduced into the late Middle Preclassic burial furniture assemblage are bone beads and a greater quantity of polished greenstone beads.

The bone beads were associated with the disk shell beads and together probably formed composite bracelets and/or anklets. Of the four polished greenstone beads, two were recovered from the cranium, suggesting placement in the mouth. The remaining two beads may have been associated with the shell and bone beads recovered from the wrists and ankles. However, their positioning in the burials is unknown. Greenstone beads associated with the disk shell beads are reported from Middle Preclassic burials at Cuello (Hammond 1999:54). It is interesting to note however, that during the Middle Preclassic at Cuello, only the burials of adult males contained greenstone beads (Hammond 1999:54). This is not the case at Colha.

The pattern of the inclusion of multiple disk shell beads in Middle Preclassic burials is also seen at the sites of Cuello (Hammond 1991a; Hammond 1999) and K'axob (Isaza Aizpurúa 1997; Isaza Aizpurúa and McAnany 1999). A single early Middle Preclassic burial associated with a circular platform at Altun Ha produced 373 disk shell beads (Pendergast 1979:173, Burial C-13/27). These burials also display uniformity in positioning as well as the inclusion of similar ceramic vessel forms (Powis et al. 2002).

Evidence suggests that the tradition of placing disk shell beads on the ankles, necks, wrists, and waists of individuals was practiced by several Middle Preclassic communities in northern Belize (Buttles 1992a). The fragile nature of the disk shell beads may have precluded them from being used as an every day adornment. If they had been worn to any extent, use wear evidence would/should be visible. It is more likely that these beads were worn on special occasions or were acquired (or produced) as part of a death ritual.

Caches

Only two early Middle Preclassic caches are reported from Colha. Both were associated with a midden deposit at Op 2012 (Potter 1982). The first is comprised of a Consejo Red bowl containing 97 disk shell beads, seven whole modified shell beads, and one clay bead (Potter 1982). This cache represents the first use of a ceramic vessel as a cache containment unit at Colha. Two blue-green stone pendants comprise the second early Middle Preclassic cache. The pendants were recovered from the original ground surface at the base of an early Middle Preclassic midden (Potter 1982).

Practical and Prestige Technologies

The majority of Middle Preclassic portable material culture examined here meets the criteria of prestige technologies (Hayden 1988). The raw materials from which these artifacts were produced, marine shell, polished greenstone, and a speleothem would have been acquired through some type of (long distance) procurement system. Bone as a raw material originates as part of a practical technology, but has been transformed into representing a prestige technology. The depositional behaviors of the artifacts representing prestige technologies suggest that they served both a social and possibly ideological function. The majority of Middle Preclassic artifacts representing prestige technologies functioned as personal adornment.

The 12 reworked ceramic notched sherds are indicative of a practical technology, as they are associated with the activity of fishing. It is unclear how to classify the reworked unperforated sherd disks, as their specific function is unknown.

Late Preclassic (400 B.C. – A.D. 100)

Late Preclassic deposits at Colha produced 284 portable artifacts and represents 12.5% of the total assemblage (Table 11.4). The majority, 130 or

45.7%, are produced from shell. Of the artifacts produced from shell, 117 are of the disk shell bead subform that was so prevalent during the Middle Preclassic. Artifacts produced from polished greenstone, n=60 or 21.1%, and bone, n=57 or 20.0%, are also highly represented. Other raw materials represented include reworked ceramic sherds (n=35) and ground stone (n=1).

As illustrated in Table 11.4, the majority of Late Preclassic artifacts, n=188 or 66.1%, are reported from burial contexts and a total of 40 artifacts, or 14.1%, of the assemblage were recovered from cache deposits. Midden deposits account for n=25 or 8.8% of the assemblage.

Table 11.4. Contextual Distribution of Late Preclassic Artifacts

Artifact	**Contextual Data**							
	Burial	**Cache**	**Construction Material**	**Midden**	**Intrusion Pit**	**Lithic Workshop**	**Ceramic lined fire pit**	**Unknown**
Modeled Clay								
Reworked Ceramic Sherds	7		5	14	3	1		5
Extensively Modified Shell	120	3		3				1
Whole Modified Shell	2			1				
Bone	40		5	5			1	6
Polished Stone	19	37	2	1		1		
Ground Stone			1	1				
Antler								
Coral								
Metal								
Specular Hematite								
Speleothem			2					
TOTALS	**188**	**40**	**13**	**25**	**3**	**2**	**1**	**12**

Burials

A total of 11 Late Preclassic burials produced 188 artifacts. During the Late Preclassic burial furniture becomes more diverse in raw material and forms. The most common raw material is shell (n=130 or 45.7%). The Middle Preclassic pattern of including disk shell beads in mass at the wrists and ankles no longer occurs. However, they are found in smaller quantities in two burials and account for 117 of the 130 shell artifacts. The inclusion of disk shell beads in Late Preclassic and Protoclassic burials is also seen at the sites of Caracol (Brown 2002, personal communication) and Uaxactun (Kidder 1947; Ricketson and Ricketson 1937). Other shell forms represented include disks (perforated and unperforated).

Polished greenstone in burial contexts becomes more prevalent and diverse in form by the Late Preclassic, but by far, beads account for the majority (n=53). A total of five burials contained greenstone. Two of "the burials", 2031 5:118 and 2031 6:117, are represented by a mass burial of disarticulated individuals (Sullivan 1991a). Polished greenstone is represented by a single specimen in four of the five Late Preclassic burials. The infant burial from Op 2031 12:51 was interred with 12 polished greenstone beads.

Three contemporaneous burials from Op 2012 produced all the Late Preclassic bone artifacts from burial contexts. Burials 2 and 3 each contained a plain bone tube, a carved and incised tube, and two ceramic disks. Burial 5 produced several artifacts of bone including 32 anthropomorphic beads, a perforated bone bar, two bone pins, and 75 disk shell beads. The anthropomorphic bone beads and disk shell beads were probably strung from the nine perforations that are positioned on the bone bar.

The infant burial at Op 2031 12:51, contained 16 associated artifacts. Included in this burial were 12 polished greenstone beads, two perforated whole shells (one with a "kill" hole), a shell disk, and a shell effigy vessel. This burial represents substantial investment in this individual. The inclusion of burial goods with children has been interpreted to represent ascribed status and the possibility of social ranking (Hammond et al. 1992). Hayden (1995:50) suggests that for "transegalitarian" societies it represents the investment of the parents.

Caches

The Late Preclassic marks the introduction of the use of lip-to-lip ceramic vessels as cache containment units. A total of 40 portable artifacts was recovered from six lip-to-lip ceramic caches. Two caches are associated with the Late Preclassic ceremonial structure at 2012. A single cache is reported from the ball court, two from the residential area at Op 2031, and one from a Late Preclassic lithic workshop at 4001. The majority of cached artifacts, n=37 or 92.5%, were manufactured from polished greenstone including 35 beads, one pendant, and one ear ornament. Only three shell artifacts are represented in caches of the Late Preclassic.

Practical and Prestige Technologies

As with the Middle Preclassic, the majority of Late Preclassic artifacts examined represent prestige technologies. Raw materials that have been transformed into items representing prestige technologies are greenstone, limestone, shell, and bone. With the exception of bone and limestone, the raw materials represented would have been acquired through a system of exchange. Examples of Late Preclassic prestige technologies at Colha include beads, pendants, a perforated bone bar, bone tubes, a rasp, and a rollerstamp. The majority of these items functioned as personal ornamentation.

Practical technologies are represented by reworked notched sherds, perforated sherd disks, and possibly pointed bone objects (bone pins). Bone pins are often associated with weaving and therefore encompass a practical technology. However, at Colha, bone pins were recovered from burial contexts and their function within that context is unknown. It is possible that they may have functioned as personal adornment on the body or in the hair. Therefore, it is possible that pointed bone objects, and in particular bone pins, may have served both a practical and prestige technology during their systemic context and thus their archaeological context. Notched sherds and perforated sherds disks are indicative of fishing and possibly the spinning of thread. The unperforated disk form continues to appear during the Late Preclassic, but again its function is problematic and therefore not easily assigned to either technology.

Protoclassic (A.D. 100 – 250)

Protoclassic contexts produced 250 artifacts and represent 11.0% of the complete assemblage (Table 11.5). The largest part of the Protoclassic artifact assemblage, n=165 or 66.0 %, is comprised of artifacts manufactured from shell. The second largest represented raw material is greenstone (n=51), which accounts for 20.4% of the assemblage. Additional raw materials represented include modeled clay (n=1), reworked ceramic sherds (n=20), bone (n=12) and specular hematite (n=1). The majority of artifacts were recovered from burial (73.2%), and cache (16.0%) contexts.

Table 11.5. Contextual Distribution of Protoclassic Artifacts

Artifacts	**Contexts**				
	Burial	**Cache**	**Construction Material**	**Midden**	**Unknown**
Modeled Clay	1				
Reworked Ceramic Sherds			11	4	5
Extensively Modified Shell	21	9			
Whole Modified Shell	130	4		1	
Bone	1	10		1	
Polished Stone	30	16	3	2	
Ground Stone					
Antler					
Coral					
Metal					
Specular Hematite		1			
Speleothem					
TOTALS	**183**	**40**	**14**	**8**	**5**

Burials

The burial furniture of five individuals produced 183 artifacts. This number is high because of the 127 whole perforated shell beads that were recovered from a single burial at Op 2012 12:34. Two (of the five) burials each contained four polished greenstone beads. The burial at Op 2012 12:34 that included the 127 whole perforated beads also contained a polished subspherical greenstone bead, disk shell beads, and a modeled peccary whistle. One burial was interred with only a whole perforated shell bead.

The four burials described above contained limited burial furniture. Only one burial was interred with diverse and elaborate furnishings. The burial at Op 2031 5-6:110 is of a mature (40-60 years of age) female (Sullivan 1991a; Wright n.d.a). This individual was interred seated with a San Antonio Golden Brown dish in her lap. Contained in the dish were 5 fragmented human skulls, a *Spondylus* shell pendant, and a single valve of *Spondylus* that was perforated. Recovered from her chest region were one polished greenstone subspherical bead, 15 polished greenstone tubular beads, five polished greenstone disk beads, and four tubular *Spondylus* beads. A ceramic effigy bottle in the form of a tapir was also associated (Sullivan 1991a). The individual and her associated artifacts, except for those positioned in her lap, were covered with a red substance. This burial is by far the most elaborate reported from Colha. This female must have held a position of high ranking within the Protoclassic Colha community.

Caches

The pattern established in the Late Preclassic of using lip-to-lip ceramic vessels as containment units continues into the Protoclassic. A total of four lip-to-lip ceramic caches containing materials examined in this analysis were recovered from Colha. Of the four caches, two contained one greenstone bead and one two coral beads (Potter 1982:109).

Of the five caches, two from Op 2012 are unique, one for its contents and the other for its containment unit. Both caches have associations with the activity of bloodletting. At Op 2012 14:55 was recovered a complex cache that included 10 perforated sharks teeth, a polished greenstone subspherical bead, three polished greenstone tubular beads, one polished greenstone disk bead, two polished greenstone barrel beads, two tubular shell beads, four shell tinklers, six pieces of cut *Spondylus*, a specular hematite flake, and a large chert macroblade (Potter 1994:33). Residue adhering to tip of the chert blade has been identified as human blood (Hester 1994; Potter 1994).

In the subcache pit was found a large chert macroblade, a chert macroblade core, and a broken polished greenstone subspherical bead (Potter 1994:33). It was determined that the chert macroblade with residue conjoined to the subcache core removed after the prior blade hinged out at the distal end. Potter (1994:33) suggests that the greenstone bead was broken by a single blow and was part of the ritual associated with the cache.

The two ceramic vessels that comprise the Op 2012 14:45 cache belong to the Sierra group and are of the Laguna Verde Incised type (Valdez 1987). Incised on the interior base and sides of each vessel are two protoglyphs (Hester 1994:4, Figure 1). These crude symbols have been interpreted by Freidel and Schele as being associated with bloodletting (Hester 1994:3). Contained within these vessels was a single polished greenstone ear ornament.

Practical and Prestige Technologies

Overall, the Protoclassic technologies represented are similar to those found during the Late Preclassic. However, the Protoclassic portable material culture illustrates a greater depositional complexity than the Late Preclassic assemblage. The majority of the Protoclassic portable material culture examined is representative of prestige technologies. Raw materials that have been transformed into prestige technologies include greenstone, marine shell, and bone. Examples of Protoclassic prestige technologies include beads, pendants, and a modeled clay ocarina. The majority of these items functioned as personal ornamentation. There is a slight decrease in the number of reworked ceramic sherds which encompass a practical technology.

Classic (A.D. 250 – 875)

Contexts assigned to the Classic period produced 52 portable artifacts and accounts for 2.2% of the total assemblage examined. In review, the Classic period at Colha is represented by three occupational phases and ceramic complexes, the Early Classic Cobweb complex, (A.D. 250 – 600), the Late Classic Bomba complex, (A.D. 600 – 700), and the Terminal Classic Masson complex, (A.D. 700 – 875). No artifacts in this analysis were derived from Early Classic contexts.

The same raw materials are represented as in the Preclassic, but in substantially smaller quantities. This may be a factor of sampling bias. The two contexts that have seen the biggest decrease in the number of associated artifacts are burials and caches. The small number of artifacts does not allow for the discovery of any depositional patterns for the Classic period at Colha.

Late Classic (A.D. 600 – 700)

The 35 Late Classic portable artifacts excavated account for only 1.5% of the total assemblage (Table 11.6). The most represented raw material is that of bone, and it accounts for 35.1% of the Late Classic assemblage. Additional raw materials represented include modeled clay (n=1), reworked ceramic sherds (n=6), shell (n=9), polished stone (n=1), ground stone (n=2), antler (n=1), coral (n=1), and specular hematite (n=1).

The majority of artifacts, n=18 or 48.6%, were derived from construction related deposits. It is possible that the construction fill may have been derived from midden deposits and therefore represents the behavior of discard. No cache deposits of Late Classic date contained materials examined in this study.

Table 11.6. Contextual Distribution of Late Classic Artifacts

Artifacts	Contextual Data					
	Burial	**Construction Material**	**Midden**	**Intrusion Pit**	**Test Pit**	**Unknown**
Modeled Clay		1				
Reworked Ceramic Sherds		3				3
Extensively Modified Shell			1			2
Whole Modified Shell		1	1			4
Bone		10	3			
Polished Stone					1	
Ground Stone		2				
Antler				1		
Coral		1				
Metal						
Specular Hematite	1					
Speleothem						
TOTALS	**1**	**18**	**5**	**1**	**1**	**9**

Burials

Only one artifact is reported from a Late Classic burial context. It is a fragmented perforated disk produced from specular hematite. Its position with the burial is currently unknown.

Practical and Prestige Technologies

Late Classic artifacts encompass both practical and prestige technologies. The raw materials from which materials of a prestige nature were produced include specular hematite, shell, bone, limestone, and greenstone. Prestige artifacts include polished greenstone ear ornaments, pendants, perforated and unperforated shell disks, and a specular hematite disk. Many of the prestige items probably functioned as personal adornment.

Practical technologies are represented by an atlatl spur, notched sherds, a bark beater, and a bone tool fragment. These are indicative of hunting, fishing, and possibly weaving or the husking of corn and paper manufacture.

Terminal Classic (A.D. 700 – 875)

Excavated Terminal Classic portable materials total 17 and accounts for 0.75% of the total assemblage (Table 11.7). This is by far the least represented period in the Colha select portable material culture assemblage examined. The decrease in artifacts represented in this analysis is probably significant but, has yet to be fully understood.

The majority, nine or 52.9%, are manufactured from shell. All nine shell artifacts were recovered from burial contexts. Additional raw materials represented include reworked ceramic sherds (n=1), bone (n=3), polished stone (n=2), and ground stone (n=2). The small number of artifact represented does not allow for the discovery of any depositional patterns.

Table 11.7. Contextual Distribution of Terminal Classic Artifacts

Artifacts	Contextual Data			
	Burial	Construction Material	Midden	Unknown
Modeled Clay				
Reworked Ceramic Sherds				1
Extensively Modified Shell	8			
Whole Modified Shell	1			
Bone		1	2	
Polished Stone		2		
Ground Stone		1	1	
Antler				
Coral				
Metal				
Specular Hematite				
Speleothem				
TOTALS	**9**	**4**	**3**	**1**

Burials

Excavations at a domestic structure associated with a lithic workshop at Op 3017 revealed four burials. Two of these burials produced materials examined in this analysis. The first burial (Op 3017 6:B2) contained the remains of a child, approximately seven years of age, and the bones of several adult individuals (Wilson n.d.). Associated with this burial were two perforated and decorated shell disks and two unperforated and decorated shell disks. The perforated and decorated shell disks were recovered from the head region of the child. They probably functioned as ear flare throat plates.

The second burial from, Op 3017 6:B3, contained the remains of a young adult female (Wilson n.d.). Associated with this individual were two perforated triangular shell items, one shell ring, and one Oliva shell tinkler. The position of these items within the burial is unknown. Other burials were associated with these individuals, but contained only ceramic vessels and/or stone tools. It is interesting that these two individuals were interred with only shell.

Practical and Prestige Technologies

Both practical and prestige technologies are represent by the Terminal Classic assemblage. Items of a prestige nature are produced from marine shell, limestone, bone, and greenstone. Items functioning in a prestige capacity are beads, perforated shell disks, decorated shell disks, polished greenstone ear ornaments, a bone rasp, and an anthropomorphic carved limestone.

A practical technology is represented by a single perforated ceramic sherd disk, a bark beater, and a bone pin fragment. It is thought that sherd disks may have functioned as spindle whorls. Bone pins are thought to have been associated with the production of textiles. However, it is possible that bone pins may have functioned as personal adornment.

Postclassic (A.D. 950 –1400)

The Postclassic assemblage is comprised of 372 artifacts and accounts for 16.8% of the total assemblage. The Postclassic at Colha is represented by three ceramic complexes, Early Postclassic Yalam (A.D. 950 - 1250), Middle Postclassic Canos (A.D. 1250 – 1300), and Late Postclassic Ranas (A.D. 1300 – 1400).

The Postclassic at Colha was originally assessed as representing an early and late facet of the Early Postclassic (Valdez 1987). Refinements in the ceramic and lithic assemblages have enabled a fine-tuning of the two facets (Barrett 1999; Valdez 1994). The early facet now corresponds to the Early Postclassic and the late facet to the Middle Postclassic. However, not all ceramic and lithic lots have been re-analyzed therefore, a general Postclassic category is also utilized in this study where early and late facets were not originally distinguished. Where possible, materials are ascribed to either the Early Postclassic or Middle Postclassic.

Data regarding contextual distributions of the Postclassic assemblage are presented according to Early Postclassic, Middle Postclassic, and general Postclassic categories (Tables 11.8, 11.9, and 11.10). Discussion of the Postclassic contextual distributions, depositional patterns, and trends are presented under a single category of Postclassic. Where available details regarding Early Postclassic and Middle Postclassic patterns are posited.

Early Postclassic (A.D. 950-1250)

Early Postclassic contexts produced 42 artifacts and accounts for 1.8% of the total assemblage (Table 11.8). The majority, 38 or 90.4%, of Early Postclassic artifacts were derived from midden deposits and reflect the behavior of discard. By far the largest represented raw material is reworked ceramic sherds (n=17). Additional raw materials represented in the Early Postclassic assemblage include modeled clay (n=6), shell (n=2), bone (5), polished stone (2), and antler (8).

Table 11.8. Contextual Distribution of Early Postclassic Artifacts

Artifact	**Contextual Data**			
	Construction Material	**Midden**	**Sherd Deposit**	**Unknown**
Modeled Clay		6		
Reworked Ceramic Sherds		16		1
Extensively Modified Shell		2		
Whole Modified Shell				
Bone		5		
Polished Stone		1	1	
Ground Stone				1
Antler		8		
Coral			1	
Metal				
Specular Hematite				
Speleothem				
TOTALS		**38**	**2**	**2**

Middle Postclassic (A.D. 1300-1400)

Middle Postclassic contexts at Colha produced 283 artifacts and accounts for 12.5% of the complete assemblage (Table 11.9). The majority, n=271 or 95.7%, of Middle Postclassic artifacts were derived from midden deposits and reflect the behavior of discard. By far the largest represented raw materials are reworked ceramic sherds (n=112), and antler (n=109). Additional raw materials represented in the Middle Postclassic assemblage include modeled clay (n=21), shell (n=18), bone (n=17), and polished stone (6).

Table 11.9. Contextual Distribution of Middle Postclassic Artifacts

Artifact	**Contextual Data**			
	Construction Material	**Midden**	**Sherd Deposit**	**Unknown**
Modeled Clay		21		
Reworked Ceramic Sherds	4	107		1
Extensively Modified Shell		1		1
Whole Modified Shell		14		2
Bone	4	13		
Polished Stone		6		
Ground Stone				
Antler		109		
Coral				
Metal				
Specular Hematite				
Speleothem				
TOTALS	**8**	**271**		**4**

General Postclassic (A.D. 950 –1400)

General Postclassic contexts at Colha produced 59 artifacts and accounts for 2.6% of the complete assemblage (Table 11.10). The majority, n=30 or 50.84%, of the Postclassic artifacts were derived from midden deposits and reflect the behavior of discard. The most represented raw materials are modeled clay (n=25), and reworked sherds (n=19). Additional raw materials include shell (n=8), polished stone (2), and antler (n=6).

Table 11.10. Contextual Distribution of General Postclassic Artifacts

Artifact	Contextual Data			
	Construction Material	**Midden**	**Sherd Deposit**	**Unknown**
Modeled Clay	17	5		3
Reworked Ceramic Sherds		18		1
Extensively Modified Shell		1		
Whole Modified Shell		3		4
Bone				
Polished Stone				2
Ground Stone				
Antler		4		2
Coral				
Metal				
Specular Hematite				
Speleothem				
TOTALS	**17**	**30**		**12**

Postclassic Summary

As evident in Table 11.11, the predominant depositional behavior during the Postclassic at Colha is discard. Of the 385 Postclassic artifacts, n=340 or 88.3%, of artifacts were recovered from midden deposits. This depositional pattern begins during the Early Postclassic and is carried through to the Middle Postclassic. Discard is best revealed through midden deposits which appear in and around the monumental center of the site. These accumulations of household waste and stone tool production waste serve as the primary source for Postclassic artifacts. The midden deposits also provided important data regarding the subsistence strategies of the Postclassic inhabitants (Caldwell 1980: 261; Miksicek 1979:158; Scott 1979, 1980, 1982, 1983; Shaw and Mangan 1994).

Table 11.11. Combined Postclassic Contextual Distribution of Artifacts

Artifact	Contextual Data			
	Construction Material	Midden	Sherd Deposit	Unknown
Modeled Clay	17	32		3
Reworked Ceramic Sherds	4	141		3
Extensively Modified Shell		4		1
Whole Modified Shell		17		6
Bone	4	18		
Polished Stone		7	1	2
Ground Stone				1
Antler		121		2
Coral			1	
Metal				
Specular Hematite				
Speleothem				
TOTALS	**25**	**340**	**2**	**18**

The majority, n=52 or 94.5%, of modeled clay artifacts are attributed to Postclassic contexts. The other raw material, which is almost exclusive to the Postclassic, is antler. While artifacts produced from antler are reported throughout the Postclassic the majority 88.6% were associated with Middle Postclassic contexts. This probably reflects the lithic technological production strategy that was in place during the Middle Postclassic (Barrett 1999; Hester and Shafer 1991a; 1994a; Michaels 1987, 1989; Michaels and Shafer 1994; Shafer 1979).

Reworked ceramic sherds account for the majority, n=173 or 37.6%, of the assemblage. The greater part of modeled clay artifacts, n=33, were recovered from Postclassic contexts. All but a two antler artifacts are reported from Postclassic contexts. Antler accounts for 20.2% of the Postclassic assemblage.

Overall, there is continuity in the types of raw materials and artifact forms represented in the Postclassic portable material culture assemblage examined in this study. However, this is not the case for the ceramic and lithic materials. The Early Postclassic and Middle Postclassic are represented by functionally complete ceramic complexes (Valdez 1987, 1994). Lithic forms that dominate the Early Postclassic are replaced with different forms during the Middle Postclassic (Hester 1982; Hester and Shafer 1991a; Shafer 1979).

Practical and Prestige Technologies

Practical technologies prevail in the Postclassic assemblage. Artifacts representative of the activities of spinning thread, weaving, and cloth production, fishing, and stone tool production are found. Prestige technologies are represented by a carved antler, modeled clay beads, modeled clay roller stamps, tinklers, polished stone celts, and carved shell ornaments.

PLACING THE COLHA ASSEMBLAGE INTO CULTURAL CONTEXT

This section discusses, in cultural context, the depositional behaviors, patterns, and trends that were revealed in the contextual analysis of the portable material culture of Colha. It also provides the opportunity for linking patterns revealed in the analysis with those represented in the cultural history. Suppositions regarding the significance of the materials analyzed and their cultural implications are posited. This review, although not exhaustive, serves to demonstrate the potential contained within the portable material culture of Colha.

Preclassic

The majority, n=1,798 or 79.4%, of the portable material culture of Colha examined in this analysis was excavated from Preclassic contexts. Preclassic materials were derived largely from four contexts, burials, caches, construction related deposits, and middens. The predominant depositional behaviors represented in the Preclassic assemblage are burials and caching. Depositional contexts suggest differential distribution during the Preclassic and especially for the Late Preclassic and Protoclassic periods.

The depositional patterns of the Middle Preclassic assemblage suggest that during the Middle Preclassic, Colha was comprised of dispersed households practicing a common ideology with a sense of community identity. This is best illustrated through the behaviors of burial and caching. During the early Middle

Preclassic burials are associated with domestic structures and show little evidence of stratification as burial furnishings are typically standardized in raw materials and artifact forms.

Late Middle Preclassic burials continue to be associated with domestic structures. However, evidence of differential treatment is introduced through a specialized burial platform associated with a domestic structure at Op 2012. The burial furnishings of the individuals interred in this platform however, continue to be standardized in raw material and artifact forms.

By the Late Preclassic and into the Protoclassic, differential access to raw materials and artifact forms is reflected in burial contexts, thus suggesting a (more rigid?) level of social stratification. During the Late Preclassic burials are associated with domestic residences. By the Protoclassic, the use of public space as burial loci has been introduced. Thereby, differential treatment is reflected in the burial assemblage and location.

Ritual activities are apparent throughout the Preclassic. During the Middle Preclassic, they are confined to the private arena. By the Late Preclassic and into the Protoclassic, ritual activities are associated with both private and public domains and seem to take on a more organized structure. This organization is best exemplified through the introduction of standardized cache containment units during the Late Preclassic. The containment unit consists primarily of lip-to-lip ceramic vessels. However, the contents are not standardized and the vessels themselves are not restricted to a particular type:variety.

Ritual intensification during the Late Preclassic and Protoclassic is reflected not only in the numerous cache deposits, but also in the erection of the stepped pyramid structure at Op 2012 and the ballcourt at Op 2009 (Eaton and Kuntsler 1980:1; Eaton et al. 1994; Meadows 2001; Potter 1980, 1982).

The number of trade items or sumptuary goods such as greenstone and marine shell indicate that Colha was an active participant in a system of exchange during the Preclassic. In the Middle Preclassic this system was probably reciprocal (Shafer 1994a). By the Late Preclassic and Protoclassic, the Colha "elites" who were controlling the production of stone tools probably also controlled the system of exchange in sumptuary goods. Control of this system enabled the elites to increase their power through displays of wealth. According to Adams (1991:135), high-value items such as greenstone were probably acquired by ruling lineages or clans as a means of legitimizing and reinforcing their status. This differential access to materials is supported by the Colha burial data.

Classic

The Classic period assemblage represents a decrease in the number of artifacts and a change in depositional contexts. Only 52 artifacts or 2.2% of the complete assemblage were derived from Classic deposits. Excavated materials were predominantly derived from construction and midden deposits. Contextual distributions reflect a different depositional strategy than during the previous Preclassic period. Depositional contexts do not suggest differential distribution as was apparent during the Late Preclassic and Protoclassic periods of occupation.

The decrease in the number and types of artifacts is of interest because the Classic was a period in which the population was estimated to have surpassed that of the Preclassic (Hester 1985a:11). Large scale craft-specialization was occurring albeit with a production strategy differing from the Preclassic (King 2000). New construction of both public and private architecture was also occurring.

It has been suggested that during the Classic period Colha was under the aegis of Altun Ha (Adams 1980:61; Shafer and Hester 1994a:48). Thus, the control of a system of exchange would have probably been in the hands of the elites of Altun Ha. Materials (greenstone) whose acquisition would have been through a system of exchange decrease during the Classic period at Colha. During the Late Preclassic and Protoclassic, participation in a system of exchange is verified by the recovery of numerous greenstone and shell artifacts. Control of lithic production during the Preclassic is attributed to an elite level group at Colha (Shafer and Hester 1994a). Burial data at Colha reflects this differential access.

By the Late to Terminal Classic, there is a decrease in the number of trade or sumptuary goods suggesting a decrease in Colha's participation in a northern Belize exchange network. At Altun Ha, the Late to Terminal Classic material culture reflects a more active participation in a system of exchange (Pendergast 1982, 1992). Furthermore, flaked stone symbols which have been attributed as representing elite structure and power decrease at Colha while increasing at Altun Ha (Meadows 2001:17). However, given excavation strategies Colha's representative sample may be a reflection of a sampling bias.

Ritual activity during the Late Classic is limited to a few possible cache deposits and the continued use of the ceremonial structure at Op 2012 and the ballcourt at Op 2009 (Eaton and Kunstler 1980:1; Potter 1980, 1982). No caches dating to this period contained materials examined in this study. By the Terminal Classic, the Op 2012 ceremonial structure ceased to be architecturally maintained and a new type of activity which may be ritual in nature is seen (Potter 1982**).**

At Operation 2012 hundreds of large Palmar Orange-polychrome plate fragments, obsidian, a greenstone artifact, and the remains of 25 individuals represented by disarticulated bone were recovered from the base of this structure (Barrett and Scherer 2002; Potter 1982; Scherer n.d.; Valdez, personal communication 2001). A similar deposit comprised of broken large Palmar Orange-polychrome plates is also found at Op 2025 (Eaton 1982). Evidence of burning is also associated with these two areas. Two shrine-like structures dating to the Terminal Classic were erected at the base of the Op 2012 ceremonial structure further supporting ritual activity at this local.

Burials from the Late Classic and Terminal Classic are typically associated with residential structures and contain few artifacts (Escobedo 1980; King 2000: 363-364). Only three burials produced materials that represent prestige technologies. A burial was also recovered from within the debitage associated with a Late Classic workshop 4045 (King 2001:364). Overall, Classic burials at Colha do not reflect a differential access to materials. However, the Classic burial sub-assemblage at Altun Ha is indicative of a highly stratified society (Pendergast 1982, 1992).

The demise of Colha during the Terminal Classic is best exemplified by the skull pit from Op 2011 (Steele et al. 1980; Massey 1989, 1994). This deposit has been interpreted as representing a termination ritual (Mock 1998). Another possibility suggested by Valdez (1989) is that this deposit is the result of environmental and social issues resulting in an internal revolt.

Postclassic

The Postclassic assemblage is represented by 372 portable artifacts and accounts for 16.8% of the total assemblage. The number of associated artifacts exceeds the earlier Classic period. However, a new depositional strategy is indicated as the majority of artifacts were derived from midden deposits and reflect the behavior of discard. Unlike the Preclassic and Classic period, the Postclassic artifacts are more representative of practical technologies. It seems that the Postclassic inhabitant of Colha were more concerned with subsistence.

The numerous notched sherds and notched pellets indicate the activity of fishing. Faunal evidence suggests that fishing was an important pursuit during this period (Shaw and Mangan 1994). The recovery of modeled clay spindle whorls, bone pins, bone needles, and bone awls support the activity of textile production. The modeled clay stamps may have been utilized to imprint designs on fabric. Paleobotanical remains indicate that cotton (*Gossypium hirstum)* was one of the crops produced. The increase in the number of antler artifacts is directly associated with a change in the stone tool technological production strategies (Barrett 1999; Hester 1982; Hester and Shafer 1991, 1994a; Michaels 1994; Shafer 1979).

Greenstone artifacts reported from Postclassic midden deposits may have been acquired from deposits associated with Preclassic and/or Classic occupation and may not reflect a system of trade or exchange in sumptuary goods. It is known that the Postclassic inhabitants of Colha utilized readily available construction material (Eaton 1979) and therefore, it is also quite probable that the Postclassic inhabitants procured other items from the remains of earlier occupations. It is not suggested that the inclusion of the greenstone in midden deposits represents any form of ritual activity.

Ritual behavior is not illustrated in the contexts of the Postclassic portable material culture examined. Postclassic burials have been reported from Op 2003 (Eaton 1979; Potter 1982). The two burials from Op 2003 were entered with stone tools and midden-like materials (Eaton 1979:87).

Concluding Comments

The research presented in this dissertation has illustrated that the cultural and social significance of the select portable material of Colha may be best described through contextual analysis and patterning. Contextual analysis and the resulting interpretation(s) of patterning have been determined through reliance upon the significant aptitude of the field archaeologist(s) and/or recorders. It has, for example, been possible to define significant Preclassic patterns and the changes occurring from the Middle Preclassic through the Protoclassic. These changes that are observable in (contextual) patterning likely reflect important cultural (social, possible ideological) values of the Maya that generally elude us at the present. The significance of these “values” may become apparent as additional studies repeat the observed patterning.

The artifact forms and subforms represented at Colha are probably present at many sites, but their treatment in the literature is limited. This should not be viewed as a criticism because it is understood that it not always possible to publish the analysis and contexts of every excavated artifact. However, it is the availability of these data that may allow for more detailed and perhaps more exacting interpretations of the meaning(s) behind the described depositional patterns.

Archaeological projects (in the Maya area) should attempt to include a review or summary of material culture beyond the now traditional subjects of ceramics and lithics. Material culture studies provide an additional tool and special perspective in the investigation(s) of the Maya. It is hoped that this dissertation will encourage archaeologists to include this grouping of artifacts in their analysis strategies because of their potential to contribute to the understanding of prehistoric Maya cultural systems.

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